CQ

NOVEMBER
1951

The Radio Amateurs' Journal

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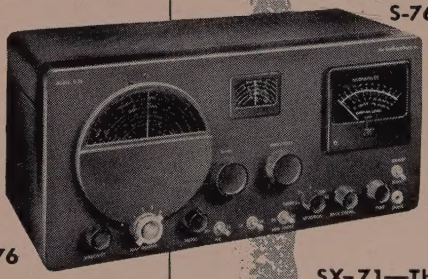

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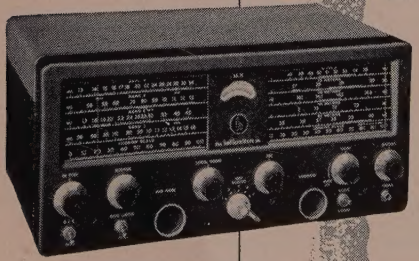

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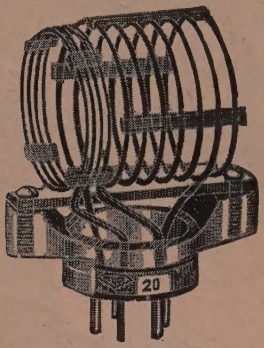

Proved best by test, the Bud 75 Watt transmitter coil with Polystyrene Base gives you improved performance, better appearance and long lasting quality. Polystyrene has proven superior to porcelain for many reasons, including far greater resistance to breaking or cracking—the Q of the coil is exceptionally high due to the extremely low power factor—pins are moulded in place and always remain perfectly aligned—sharp corners are eliminated, no danger of chipping—transparency adds to smooth, modern appearance.

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FREE This colorful decal of the ARRL safety code which you can mount on your rig. It will be a constant reminder to use care and common sense when working around your transmitter.

You can get this decal absolutely free by sending a stamped, self-addressed envelope to Bud Radio, Dept. CQ-11, 2118 East 55th Street, Cleveland 3, Ohio. Do it today, it might save you from death or serious injury.

ALWAYS BE CAREFUL

★ ★ ★

(A) Kill all transmitter circuits completely before touching anything behind the panel.
(B) Never wear 'phones while working on the transmitter
(C) Never pull test arcs from transmitter tank circuits.
(D) Don't shoot trouble in a transmitter when tired or sleepy.
(E) When working on the transmitter, avoid bodily contact with metal racks or frames, radiators, damp floors or other grounded objects.
(F) Keep one hand in your pocket.
(G) Develop your own safety technique. Take time to be careful.

★ ★ ★

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Aerial Mounting Brackets
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These items designed and manufactured exclusively by BUD.

CQ

VOL. 7 NO. 11 NOVEMBER, 1951

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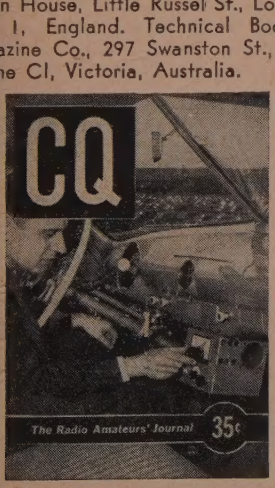

OUR COVER

With a new five-band mobile receiver just installed, W2RYT (George Floyd, Editor of the G-E Ham News) is taking a look over the 2-meter band. If this band lacks activity, there are four more to try—6, 10, 20 and 75 meters. Built and described in this issue by W2AEF, this receiver is indeed *Another Standard of Comparison.*

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SCRATCH

Feenix, A

Deer Hon. Ed:

Have you ever noticed that sometimes jus little bit of extra information can save s people from an awful lot of trubble? Like the that didn't know the gun was loaded, or the fel that didn't know that the pretty candle wa stick of dynamite? Well, dawgonnit, Hon. I are just spending very tiring day, and all acct. of something I didn't know.

It are all starting one day last week w Brother Itchi are having to leave the ranch the day, and I staying home to watching o things. Before he leaving he telling me to stay of trubble (he knows me pretty well, huh?) not to do much of anything except fuss with transmitter, or something.

So, after he leaving, I going in the shack a tuning across the band a cupple of times, but no ing very much on, so I decide to look throu some of the old radio magazines that are aro the shack. After reading for awhile are com to conclusion that some of the articles are rat funny. Here is one called "A Junk-Box Kilow for $1.79". Wow! The author of this one cla he spent only $1.79 for his kilowatt rig! He fo all the parts he needed in the junk-box, and buck seventy-nine he spent went for paint. J give me an hour to go through that guys ju box and all he would have left is junk.

Here's a good one. "How to Work 100 Countr with One Watt". Hah. In factly, double hah. T fellow ought to work for a fiction magazine. ought to have called the article "How to W 100 Countries with One WHAT". More t likely he had a five kilowatt rig, for a driver t is, tied to a really big final. Oh, he even has QSL cards to prove it. Maybe he runs a print sh

And here's a real beauty. This article is cal "How I Worked Across the Country with 160-Meter Vertical Underground Antenna". See as how the guy found an old well on his fa and decided to put an antenna down the w and..... Hon. Ed., I just don't believe it. At t point in my reading, after seeing article on und ground antennas, I suddenly realizing that ground system are in sad need of repair. So, I outside, and, sure enough, the pipe that I driven into the ground are all rusted and fall apart.

(Continued on page

C

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Whether you're "edging the band" or working the middle . . . it's a real satisfaction to know exactly where you are, right down to the kilocycle. That's why DRIFT is the most important characteristic you look for in your crystal controls. Little wonder that tens of thousands of Amateurs—all over the world—prefer PR Precision CRYSTALS. They are truly LOW DRIFT . . . meet commercial drift standards. PRs have a drift characteristic of less than 2 cycles per MC per degree Centigrade. This LOW DRIFT characteristic does not prevent PRs from giving HIGH ACTIVITY AND OUTPUT, traditionally demanded by amateurs. You can get the EXACT FREQUENCY YOU WANT (Integral kilocycle) WITHIN AMATEUR BANDS, AT NO EXTRA COST. Accept no substitute! Get PRs at your jobbers.

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the O.P.FEI Private Life of CQ

If any of the really ambitious readers of were to dig back into the past issues, they w probably find that the last of the series "From Private Life of CQ" appeared around July, 1 The original idea of this column was to provi sounding board—where the editors could pre some of their problems and headaches to the r ers. Generally speaking, it is a rather inno affair and scarcely ever announces anything earth-shaking import. Nevertheless, it is a useful means of communication between the edi and the readers of CQ.

Novice Editor?

A question being asked quite frequently s the untimely death of our Novice Editor, Drumm, is whether or not we will make ano start on the "Novice Shack". The answer is a quick "yes"! If at all possible, "The Novice Sha will return in our December issue. Present p call for it to be written by a friend of W2 The number of novice licenses have so far exce the most optimistic figures prepared prior to Ju 1951. Those of you who read and liked Carl's column need have no fear—since CQ is doing ev thing possible to find another good Novice Ed

CQ Editorial Payment

CQ has always paid for a very large percen of its editorial material. Starting on the first of new year the Editors of CQ announce a new ment policy for editorial material which will commensurate with the value of the article. In past, most material was paid for at a straight $1 per printed page rate. The new payment plan call for various rates of payment ranging \$10.00 to $20.00 per printed page. Articles of usual interest will, of course, merit the highest ment. Articles and manuscripts of only mode interest, or articles of a strictly non-technical na will be relegated to payments between $10.00 $15.00 per printed page. On occasion, an additi amount will be paid for photographs—espec taken for the publication in CQ. Good cartoons still at a demand and the cartoon rate will ex from $5.00 to $25.00. Single column cartoons probably bring between $5.00 and $10.00. La cartoons, including those taking a full page, be rated up to $25.00.

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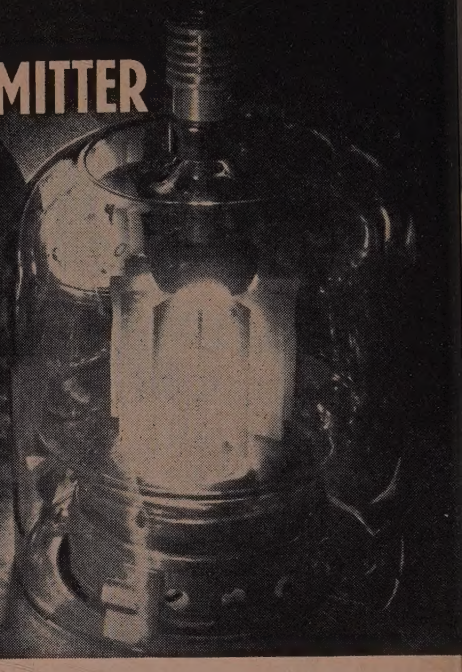
FOR THE DELUXE TRANSMITTER



- Top choice is the Eimac 4-400A tetrode and air-system socket.

Modern in design . . . unchallenged in performance . . . the 400-watt Eimac 4-400A tetrode and the Eimac air-system socket are the answer for those who want the ultimate in transmitters.

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D-C Screen Voltage	500	Volts
D-C Grid Voltage	−220	Volts
D-C Plate Current	350	Ma.
D-C Screen Current	46	Ma.
D-C Grid Current	19	Ma.
Screen Dissipation	23	Watts
Grid Dissipation	1.9	Watts
Peak R-F Grid Input Voltage	320	Volts
Driving Power	6.	Watts
Plate Power Input	1050	Watts
Plate Dissipation	250	Watts
Plate Power Output	800	Watts

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EDITORIAL

HELLO! I'M BILL MCNATT, W9NFK, your new *VHF-UHF* Editor. For the past five years the XYL, Helen, and myself put out a little magazine called "The VHF News". Because we could no longer find time to continue the magazine, it has been taken over by *CQ*, and I will conduct the *VHF-UHF* column in these pages. Just in case you're wondering, I was originally licensed as W6FEW in 1930. Since 1936, I've held the successive calls, W7GEZ, W8TLJ and, in 1941, received W9NFK. Pre-war, I operated 80, 40 and 20 c.w. Since then, I've been on 144 mc, phone and c.w.

The Species "VHF Man"

The usual attitude of the average low-frequency man, when v.h.f. is mentioned, is, "So what? Can you work farther away than you can holler??" Then, when the v.h.f. man attempts to recount factual data, the low frequency boy either refuses to believe it, or changes the subject. This is no exaggeration. In my efforts to get my v.h.f. friends to encourage more fellows to utilize v.h.f. bands for local to medium distance contacts, the report has come back that the low-frequency ham has refused to believe published reports of 600 mile to 1400 mile DX on 2 meters! Others complain that it takes a "highly specialized technician" to make v.h.f. gear work properly. These attitudes become a fairly tough barrier to proper understanding, although they are something that cannot and will *not* endure.

Since all of us were originally low-frequency operators, how is it that we have the species v.h.f. man?" Hams, generally, are regarded as somewhat "odd" persons by their fellowmen. Within the ranks of amateur radio, v.h.f. men are usually regarded by their fellow hams as being somewhat "odd" amateurs especially when they pride themselves on having WAS on 6 meters, or 18 to 21 States on 2 meters, or 300 miles on 420 mc. *DX*, that is!

Amateur radio began as a result of curiosity about wave propagation by some able gentlemen known as Kerr, Faraday, Maxwell, Hertz, Marconi and others. Radio amateurs, as we know them today, originally were inspired by a curiosity to find out how far they could communicate with the coils, spark gaps, coherers and "Leyden jars" and other items that comprised the up-to-date station around 1920 and earlier. They didn't care much about the frequency involved, but they *had* the pioneering spirit that pushed them forward to devise *new* equipment, *new* circuits, *new* antennas, *new* ideas. As soon as one band of frequencies was explored, these pioneers trimmed coils and antennas and pushed on to the next band. With them, they encouraged others to follow. However, as the years passed and the number of bands available for amateur operation increased, the percentage of amateurs having the pioneering spirit decreased. There are no known statistics on this subject, but it seems logical that although several thousands of hams still are inspired by the thought of new radio frequency frontiers, they are outnumbered by the settlers who are content to buy a ready made rig and merely operate. A counter argument is quite valid: many low frequency operators have as their hobby traffic handling, working hams in other countries, or merely maintaining contacts with friends on the air. But, the v.h.f. man, today, represents the pioneers of many years ago. He, more than anyone else, seeks new frontiers in amateur radio.

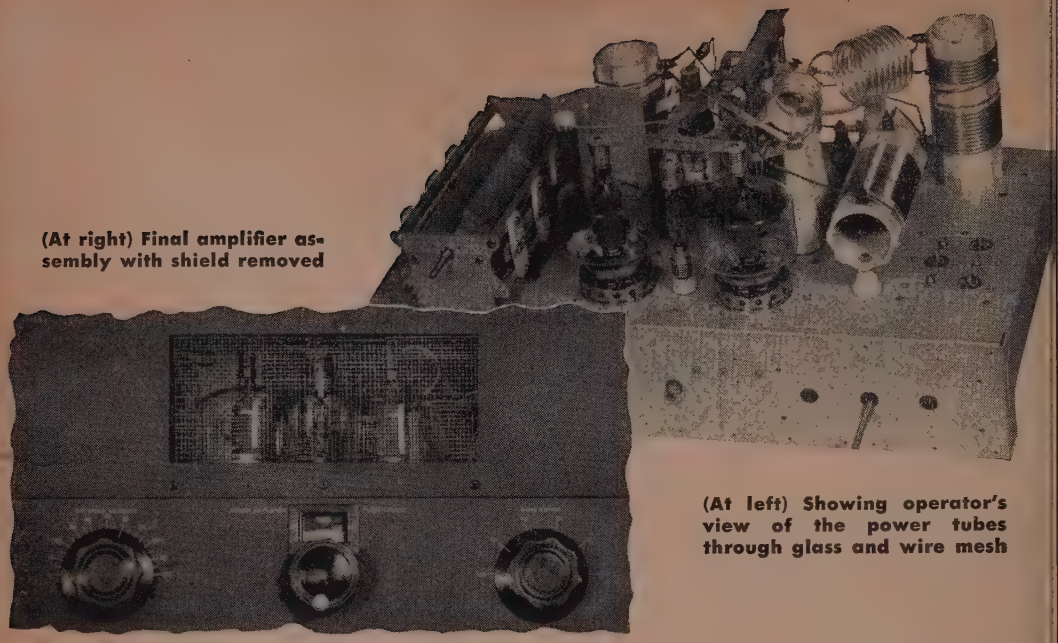
Yet, some of the v.h.f. bands are being occupied by settlers. The trouble is, there *aren't* enough of them. *Megacycles* of bandwidth on 6 meters, 2 meters, and other bands wait for the QRM-ridden low-frequency operators to use them for local (10 to 100 miles) contacts. The maximum range depends upon the power, the receiver, the frequency and the antenna and its height. As for QRM, there is no excuse for it on v.h.f.

Much, much more information on v.h.f. has been written, could be written and should be written in order to acquaint you with the v.h.f.; its joys, its sorrows, its equipment and its fascinations. Obviously, we can't write a book on one page of space. But, we invite you to start reading "The VHF-UHF News" column!

—Bill McNatt, W9NFK

Operation "Sparkplug"

It will require a few issues before *CQ* settles on its new course, but present plans show promise of some scintillating pages in the near future!



(At right) Final amplifier assembly with shield removed

(At left) Showing operator's view of the power tubes through glass and wire mesh

Features of the KW-1's power amplifier

The final amplifier of the new Collins KW-1 amateur transmitter utilizes two 4-250A tetrodes in parallel, operated well within their ratings at 1000 watts input. The ease of neutralization, stability, and low driving power requirements of these tubes ideally suit them for this high power rig which was designed throughout for maximum TVI reduction.

A pi network is used to match the plate impedance of the 4-250A's to a value of approximately 300 ohms at the input of the L matching section, which in turn transforms the 300 ohms to 50 ohms to feed a standard coaxial line such as RG8/U. Use of the L section in addition to the pi section greatly increases attenuation of the higher harmonics.

A band switch ganged with the band switches of the exciter selects the proper value of inductance in both L and pi sections. Thus bandswitching of the entire transmitter is accomplished simultaneously with a single knob on the front panel.

The power amplifier assembly is completely enclosed in a shield box, a section of which consists of wire mesh. The operator has a clear view of the power tubes through this mesh and a glass window in the front panel of the transmitter.

Another Standard of Comparison

W. M. SCHERER, W2AEF*

The Gold Plated Special designed by W2AEF has served as a standard of comparison for many of the finest post-war transmitter/exciters. Now Bill Scherer describes an all-band mobile receiver that is destined to take its place alongside the GPS as a major contribution to sound design incorporating the special requirements of amateur service. —Editor.

A compact 4 to 144 mc complete bandswitching mobile receiver. Bandspread tuning covers the full range of the National MCN dial on all bands.

MOBILE OPERATION continues to accelerate in popularity, yet almost all of the published emphasis has been on transmitter and antenna design. A good communications receiver, engineered specifically for all-band mobile communication, has long been overdue. The problems encountered in such a project are many and the final results cannot achieve standard communication receiver performance without being complicated electrically and mechanically. Nevertheless, this author's experience in designing and describing the Gold Plated Special, one of the first completely engineered post-war exciters, gave ample evidence that many amateurs were willing to invest the time and effort to build a piece of equipment that would give years of top notch trouble-free performance.

So this all-band mobile receiver is the result of our efforts to design a receiver which could serve as a standard for those to come in later years. No compromise has been made with mechanical or electrical efficiency. Comparative tests have demonstrated performance is equal to, or better than many standard communication receivers. There is no basis for comparison between mobile converter-receiver combinations where this complete receiver out-performed them by a tremendous margin.

Although the noise figure of 144 mc is slightly higher than that of a cascode amplifier, signals that were heard on several good cascode converters were copied with equal ease on our receiver. Performance and design features alone are adequate to justify such an ambitious project; the tremendous frequency range is an added bonus. Coverage is provided from 75-transmitter phone through the 144-mc band . . . . greater range than any commercial unit available for amateur use.

*100 East Palisade Ave., Englewood, N. J.

During the past year all continents have been easily heard, from the car, on the 14 and 28 mc bands. On 75 meters signals have been heard from the West Coast, Europe and South Africa.

While the duplication of this receiver is a project only to be undertaken by an experienced amateur, the following features are just some of the rewards for your effort: Band-switched high-*Q* gang-tuned r-f circuits covering the 144, 50, 28, 14 and 4-mc bands; double conversion (1488 and 262 kc); high sensitivity (better than 1.5 μv on all bands); excellent selectivity; low noise figure; voltage-regulated high-frequency oscillator of excellent stability; good reset accuracy; no spurious or harmonic beats from oscillators; automatic noise limiter; low-impedance input; antenna trimmer; and 2 watts of audio output into a self-contained loud speaker. Yet the entire unit is mounted in a cabinet less than 6 inches square, small enough for steering column mounting. All of these electrical features are provided at a power requirement of only 6 volts at 2 amps and 200-300 volts at 45-65 ma.

The r.f. stage and the first mixer use 6AK5's for high gain and low noise figure. Gang tuning of both stages is used—in preference to broadbanding—in order to obtain high Q circuits that will have good gain, low noise, and good selectivity for image reduction and freedom from cross modulation. Slug tuned inductors are employed to facilitate tracking adjustments.

From the circuit diagram, *Figure 1,* it will be noted that the 144 mc inductor *L10* remains in the circuit on all bands. When the bandswitch is in the 144 mc position, the tuning capacitor *C3* is shorted to ground, and the bottom end of the inductor is also grounded. Only the input capacitance of the tube and the stray circuit capacitances are across *L10,* thus the tuning of this stage is broadbanded to a certain extent; however, the ground lead from

C1—22 μμf ceramic
C2—50 μμf, National PSE 50
C3, C3A, C22—Defiance (All Star Products) Model C3 (straight line capacitance curve 34F5) without trimmers. 15 μμf per section. For C3 and C3A remove all rotor plates except one.
C4, C5, C6, C8, C15, C26, C30, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C47, C50—.01 μf disc ceramic.
C7, C11—50 μμf ceramic
C9, C10, C12, C13—7-45 μμf ceramic
C14—5 μμf ceramic
C16, C17, C19, C20—7-45 μμf ceramic, neg. temp. coef.
C21—3-30 μμf ceramic, neg. temp. coef.
C23, C24—50 μμf silver mica
C25, C33—100 μμf silver mica
C27, C28, C29—50 μμf ceramic feedthru
C31—.002 μf ceramic HyKap
C32—250 μμf silver mica
C44, C45—100 μμf part of T4
C46—.01 μf, 400 volt paper
C48—.002 μf, 400 volt paper
C49—.001 μf, 400 volt paper
C51—10 μf, 25 volt electrolytic
C52, C55—24 μμf zero temp. coef.
C53, C54—35 μμf zero temp. coef.
R1, R12, R18—270 ohms, 1/2 w.
R2, R6, R7, R9—27,000 ohms, 1/2 w.
R3—15,000 ohms, 1/2 w.
R4, R10, R14, R20, R31—2,000 ohms, 1/2 w.
R5—10,000 ohms, 1/2 w.
R8—22,000 ohms, 1/2 w.
R11, R16—100,000 ohms 1/2 w.
R13, R19, R21—47,000 ohms, 1/2 w.
R17—2.2 meg., 1/2 w.
R22—1 meg., 1/2 w.
R23—820,000 ohms, 1/2 w.
R24, R25, R28—270,000 ohms, 1/2 w.
R26—500,000 ohms, miniature potentiometer
R27—10 meg. 1/2 w.
R29—470,000 ohms, 1/2 w.
R30—560 ohms, 1 w.
R32—6000 ohms, 5 watt, with slider
J1—Single closed circuit jack
P1—Jones plug, P304-AB
RFC1—2.5 mh, National R100
Spkr—Perm-O-Flux, 3", model 3A
SW-A, B, C, D, E, F—Ceramic switch, 3 gang, each 2 circuits 5 positions, Mallory #181C or Centralab #2525.
T1—Stanwyk, 1st r.f. #SM129, 1500 kc
T2, T3—Meissner, input #16-6752, 262 kc
T4—Meissner, output #16-6754, 262 kc
T5—Stancor, a.f. output #A3877, 5000 ohms to 4 ohm v.c.
L1—15 turns #28 enamel, scramble wound over bottom turns of L2, after first wrapping several layers of electrical scotch tape around latter.
L2—4 mc, 70 turns #32 enamel, close wound on CTC #LS3, 3/8" diameter slug tuned form.
L3—1 turn #20 plastic covered wound over bottom turns of L4.
L4—14 mc, 12 turns #22 enamel close wound on CTC #LS5, 3/8" diameter ceramic slug tuned form.
L5—1 turn #20 plastic covered wound over bottom turn of L6.
L6—28 mc, 10 turns #18 enamel close wound on CTC #LS6, 1/4" diameter ceramic slug tuned form.
L7—1 turn #20 plastic covered wound over bottom turn of L8.
L8—50 mc, 6 turns #18 enamel, close wound on CTC #LS6 form.
L9—1 1/2 turns #20 plastic covered wound around middle of L10.
L10—144 mc, 5 turns #16 enamel space wound on CTC #LS6 form.
L11—4 mc, same as L12
L12—14 mc, 10 turns #22 enamel close wound on CTC #LS5 form.
L13—28 mc, 10 turns #18 enamel close wound on CTC #LS6 form.
L14—50 mc, 4 turns #18 enamel space wound on CTC #LS6 form.
L15—144 mc, 3 turns #18 enamel, wound on 1/4". diameter polystyrene rod with 8/32 brass slug, winding length 1/2".
L16—4 mc, 25 turns #32 enamel close wound on CTC #LS3 form.
L17—14 mc, 15 turns #26 enamel close wound on CTC #LS5 form.
L18—28 mc, 14 turns #26 enamel close wound on CTC #LS6 form.
L19—50 mc, 6 turns #24 enamel space wound on CTC #LS6 form.
L20—144 mc, 3 turns #22 enamel space wound on CTC #LS6 form.
L21—1750 kc, 63 turns #32 enamel close wound on CTC #LS4, 1/2" diameter slug tuned form, tapped at 11th turn from bottom.

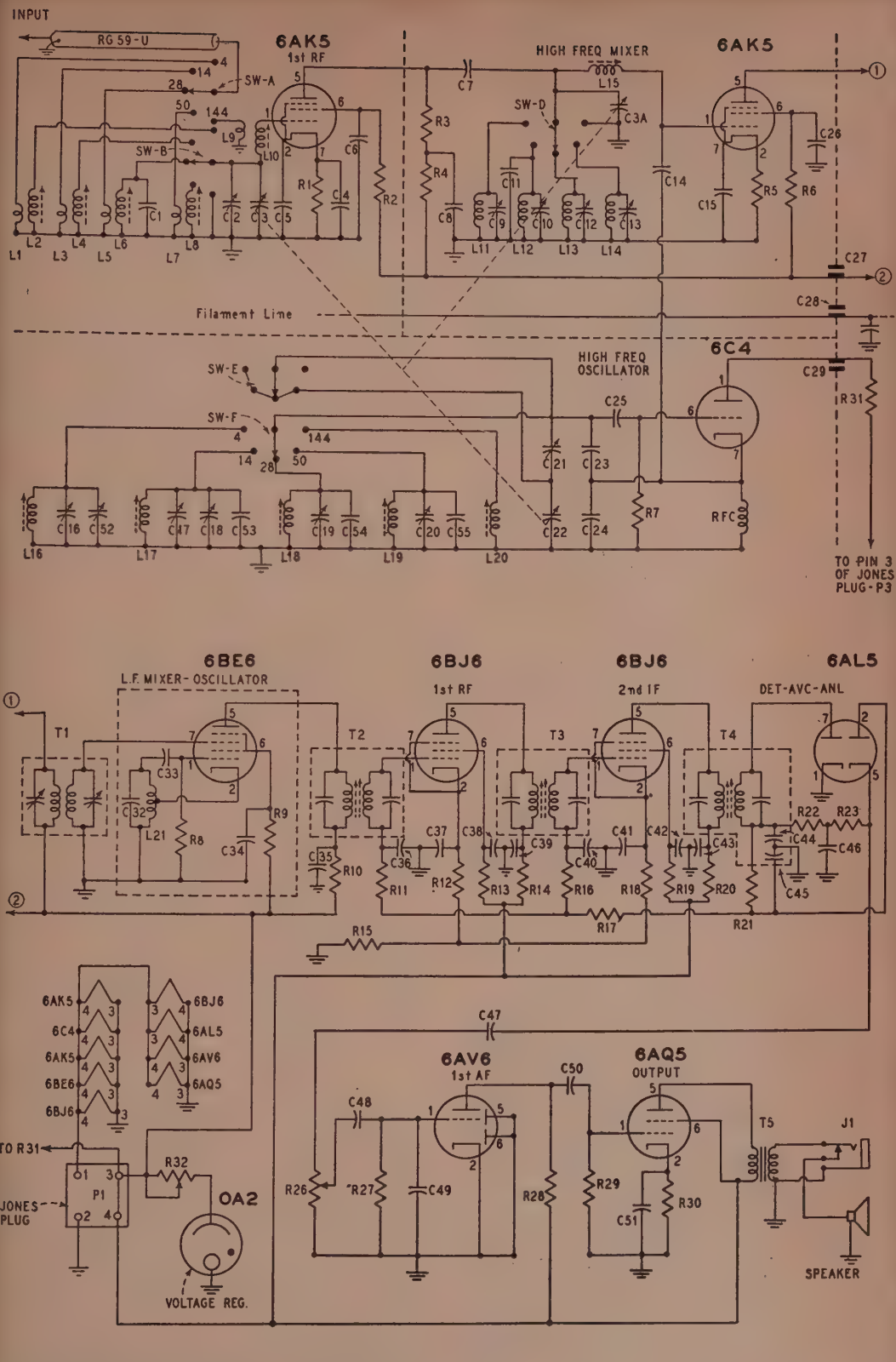
Fig. 1. Wiring schematic of the all band mobile receiver. →

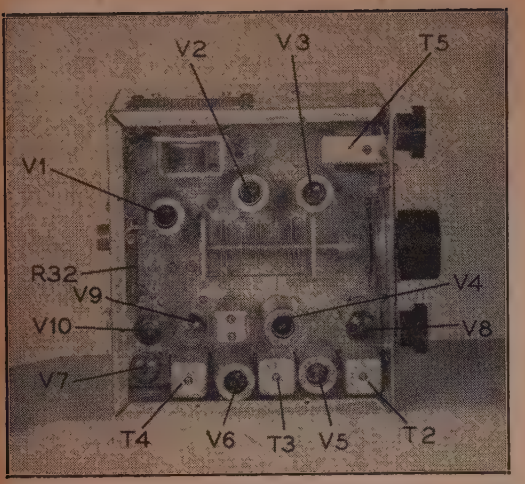
the switch and the contact elements of the switch still present a fair amount of inductance at 144 mc; so the tuning capacitor is effectively tapped across a small portion of the total inductance of the 144 mc circuit, resulting in a degree of bandspread tuning. See *Figure 2D*. Actual response varies by about 1 mc.

This arrangement grew out of the fact that the receiver was originally designed to operate only as high as 30 mc. It was not until the mechanical work was finished, that it was decided to extend the range to include both the 50 and 144 mc bands. The physical layout produced a grid lead between the socket terminal and the associated switch terminal (swinger) that was about 1½" long. The stator of the tuning capacitor was connected directly to the switch terminal. See *Figures 2A* and *2B*. At 30 mc, this length of lead would have been inconsequential, but at 144 mc it represented considerable inductance. This meant that any inductor connected between the 144 mc switch position *2b* and ground would need to be very small for the total circuit to resonate at 144 mc. As a result this would have been a low impedance circuit with low gain and poor efficiency, leaving very little lumped inductance for satisfactory coupling to the antenna.

Figure 2C indicates the revised physical arrangement. The effective electrical circuit is shown at *Figure 2D*.

C2 is the r.f. stage trimmer to compensate for variations in input reactance of the antenna. After the receiver has been correctly aligned, this capacitor need be set only once for any given band, and


INPUT
RG 59-U
6AK5
1st RF
SW-A
SW-B
SW-D
SW-E
SW-F
HIGH FREQ MIXER
6AK5
HIGH FREQ OSCILLATOR
6C4
Filament Line
TO PIN 3 OF JONES PLUG-P3
6BE6
L.F. MIXER-OSCILLATOR
6BJ6
1st RF
6BJ6
2nd IF
6AL5
DET-AVC-ANL
6AV6
1st AF
6AQ5
OUTPUT
6AK5
6C4
6AK5
6BE6
6BJ6
6BJ6
6AL5
6AV6
6AQ5
TO R31
JONES PLUG
P1
OA2
VOLTAGE REG.
SPEAKER



Top view of the all band mobile receiver. T1 is between V4 and V9. The small loud speaker may be seen at the upper left.

C3 will then properly track over the entire band.

Capacitive coupling is used between the plate of the r.f. stage and the grid of the mixer. The 6AK5 mixer is pentode connected, since this provides more gain. With proper injection of oscillator voltage the pentode was found to be slightly quieter than the triode connected tube.

The high frequency oscillator is a separate stage employing a 6C4 in a Colpitts circuit. This was chosen primarily because it provides a two terminal oscillator and does not involve tapping of the inductor. It also permits grounding one side of the tuning capacitor. The second harmonic of the oscillator is used, for mixing purposes, on all bands except on the 4 mc—where the oscillator fundamental is utilized. The employment of the second harmonic permits better control of mixer injection voltage. Improved stability is also assured, especially on the 144 mc band where the oscillator padding capacitors would have to be reduced in value if the fundamental were to be used. The third, and most important, advantage derived from the use of the oscillator harmonic is that all pulling effects upon the oscillator frequency, normally experienced when tuning the mixer stage, are entirely eliminated.*

Bandspreading is accomplished through the use of parallel padding capacitors, except on the 144 mc band where a variable trimmer is switched in series with the tuning capacitor. This latter arrangement was necessary, because parallel padding requires too much capacitance to properly spread this band. An OA2 voltage regulator tube maintains a constant plate potential of 150 volts for the h.f. oscillator.

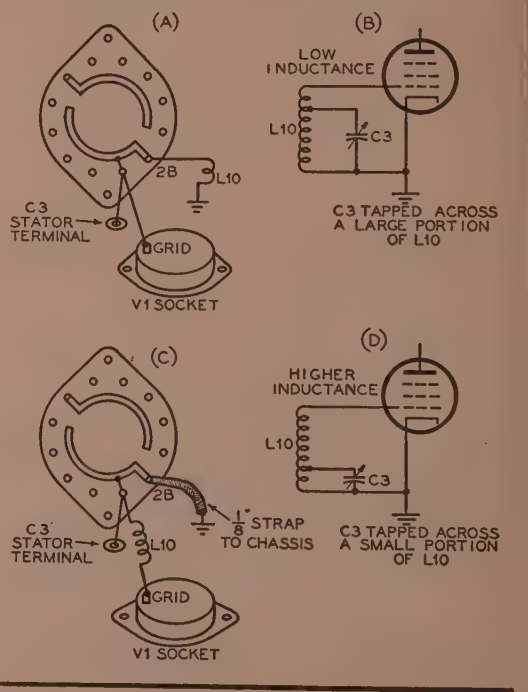
The second mixer employs a 6BE6 pentagrid converter; the output feeds two 262 kc i.f. stages. The oscillator section operates at 1750 kc while the signal input circuit is tuned to 1488 kc, the output frequency of the first mixer. The use of the latter frequency may be questioned due to the 3 mc images appearing in the 50 and 144 mc bands. However, amateur signal images appear only between 53 and 54 mc, and between 147 and 148 mc, being those of amateur stations operating between 50 to 51 mc, and 144 to 145 mc respectively. There is little attenuation of the 144 mc images since the r.f. circuits for this band are practically broadbanded. On the 50 ms band the image reduction is considerably better due to the high Q tuned r.f. circuits.

To date, no annoying images have been encountered from other services; however, if the h.f. oscillator were tuned to the high frequency side, interfering images could result from TV stations operating on Channel 2 (in the case of the 50 mc band), or from police and taxi radios (in the case of the 144 mc band).

The two low frequency i.f. stages, operating at a frequency of 262 kc, employ 6BJ6's resulting in a considerable improvement over the selectivity obtained with the customary h.f. converter audio radio combination.

A 6AL5 is used as the detector, a.v.c., and series type diode noise limiter. No a.n.l. on-off switch is included, since mobile operation almost always requires a noise limiter, and virtually no loss in audio quality is experienced when the limiter is in the circuit. The first a.f. stage is a 6AV6, the triode high mu section furnishes ample gain to drive the

Fig. 2. See text regarding method of connecting bandswitch for 144 mc band.



*Reset accuracy of the oscillator frequency on the 144 mc band, when the bandswitch was rotated, was at first very poor due to play in the bandswitch. This was improved to a satisfactory point by cementing the ceramic rotator to the shaft, so that the play at this point was eliminated.

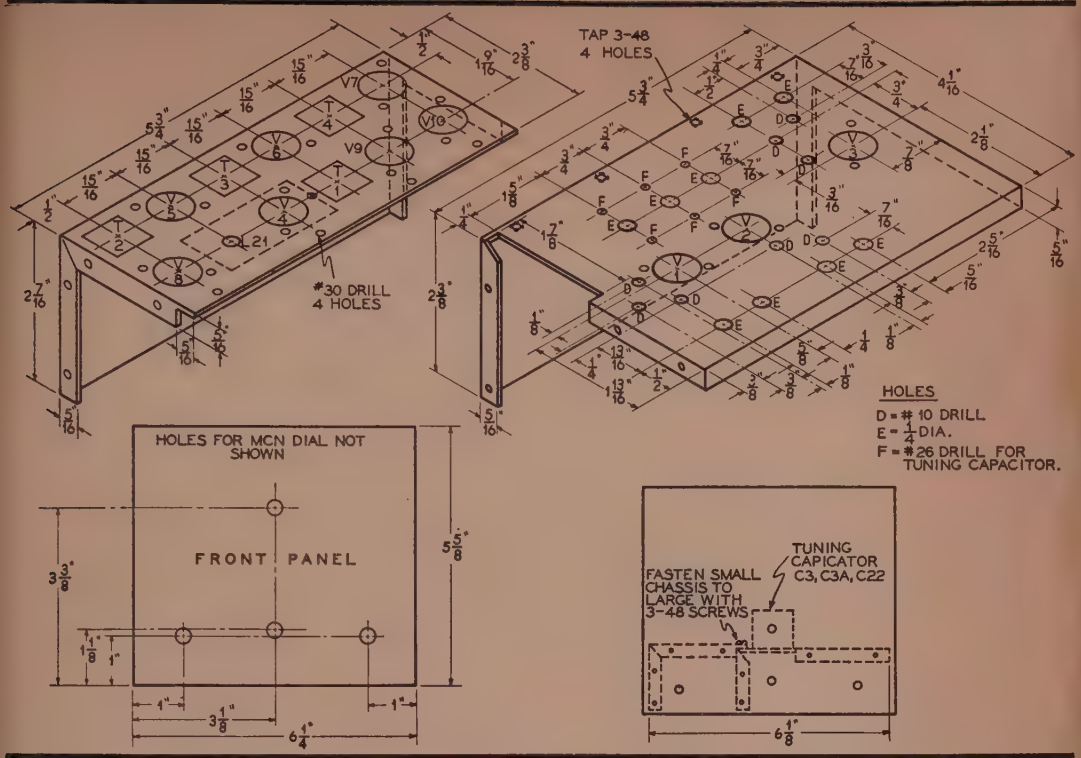


Fig. 3. Dimensions for the two chassis which are connected to each other and to the panel as shown at lower right. Front panel data is at lower left.

6AQ5 output stage. A 6AK6 could be substituted in the output with a loss in audio drive to the speaker. The loudspeaker is mounted in the receiver cabinet to make the unit more self contained. This also adds to convenient portability in cases where the receiver may be removed for fixed station or field operation. A jack is provided to permit the use of a larger external speaker.

On 144 mc a tendency towards microphonics may be experienced due to vibrations from the speaker affecting components in the high frequency oscillator. This may be reduced by securing the components, such as the fixed mica padders, to the chassis by means of a few drops of Glyptal.

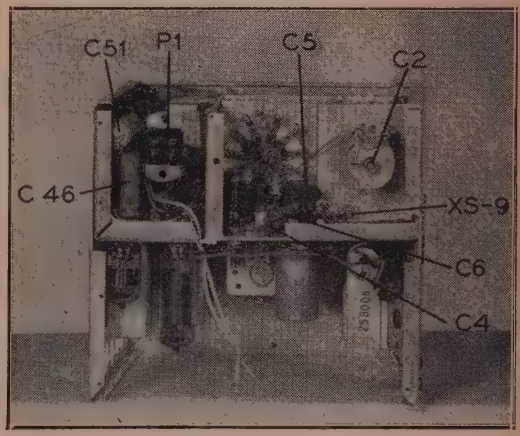
Construction

Construction of the receiver is not as complicated as it may first appear from the photographs. The high frequency front end and the low frequency rear end are built on separate "L" shaped chassis to allow easy access for wiring. After the individual sections have been wired and tested, the two chassis are bolted together, and are electrically connected by soldering the proper leads to the four feedthrough terminals on the inner side of the h.f. section. See photographs.

Dimensions for the two chassis sections are given in *Figure 3*. These are made of 1/16" thick aluminum, and they may easily be bent into shape in the home workshop. Dimensions for the front panel and the method of mounting the chassis may be found in the same diagram. Some holes are not shown, since they may be better located when the parts concerned are to be mounted. Also for the same reason, only the center location for each socket and i.f. transformer is shown.

On the low frequency chassis, the dotted lines indicate the positon of the 1750 kc oscillator shield can under the chassis. The can is 1" x 1¾" x 2⅛", and may be secured by spade bolts or small right

Rear view, showing the two chassis lapped together. The low frequency, L shaped, chassis is at the left. The high frequency one is at the right.



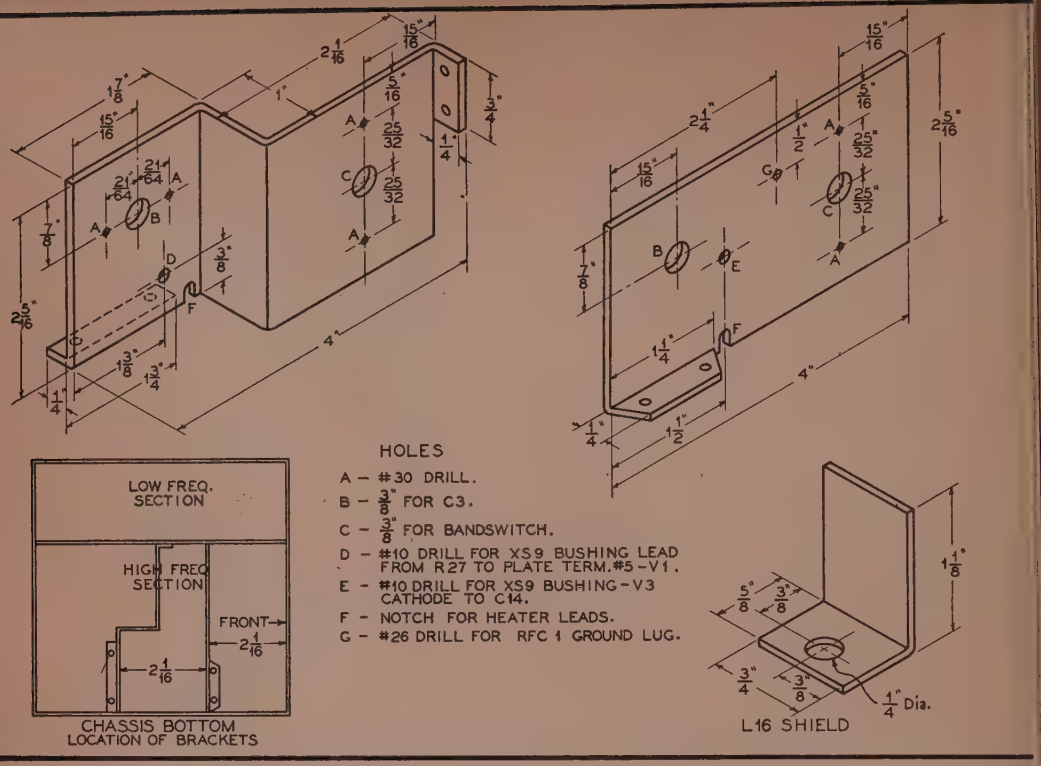


Fig. 4. Dimensions for the bandswitch brackets and the L16 shield. The switch should be mounted on the brackets before installing the latter, as shown at lower left.

angle brackets. If the ¾" square 1500 kc transformer *T1* is not available, a little larger size component may be squeezed in place by moving the sockets for *V4* and *V9*.

A four and a six terminal tie point strip are mounted on the side of the low frequency chassis. See pictorial diagram *Figure 5*. These should be placed so that the terminals are about 1½" from the top of the chassis.

The shields and the brackets for the bandswitch should be made and mounted according to *Figure 4*. The switch is mainly supported by these brackets. Additional support may be obtained by securing the front bushing to the panel with a nut on both sides of the panel. On some switches the front bushing may not be long enough; so a right angle bracket must be used instead. Fasten it to the side of the h.f. chassis. The antenna trimmer *C2* is mounted on the rear bracket and is controlled from the front panel with an insulated shaft.

Mounting dimensions for the ceramic trimmers are not given, since they will vary according to the actual trimmers used; however, the holes required for mounting these on the switch brackets should be made before the brackets are assembled with the switch.

The cabinet is made in separate sections which are screwed to the chassis and the panel. ⅝" holes are punched in all the sides for adequate ventilation. Reference to the photographs and the pictorial diagrams will greatly aid in the determination of the location and the assembly of all various parts.

Wiring

After all the mechanical work has been completed, the chassis, panel, etc., should be disassembled before the wiring is started. The l.f. chassis should be wired first. *Figure 5*, a pictorial diagram, should be used as a guide for the placement of components and the routing of leads for easy installaton within the small confines of the unit. Soldering lugs for grounds, at the points marked *G*, should be fastened to the chassis, by the screws and nuts securing the tube sockets.

First wire the heaters and all ground lugs to their respective socket terminals. Also wire jumpers between pins *2* and *7* of sockets *V5* and *V6*. Then terminals *1* and *3* of i.f. transformers *T2*, *T3* and *T4* should be wired to their respective socket terminals. Wire a ground lead to terminal *6* of *T4*.

Then connect in the following order: *R11*, *C36*, *R10*, pin *1* of *V8*, *R9*, *C35*, *R13*, *C38*, *R14*, *C39*, *R12*, *C37*, *R16*, *R19*, *R20*, *C42*, *C40*, *R18*, *C41*, *C43*, *R21*, *R17*, *R22*, *R23*, *R25*, *R24*, *R29*, *R30*, pin *2* of *V10* and *C51*, *R28*, *R27*, *C50*, *C47*, and *R15*. Wherever possible, these parts should be placed under the tie strips along the side of the chassis.

Connect tie point terminals as follows: *3* to *6* to *9*, *4* to *8*, *5* to *7*, and *5* to pin *6* of *V10*. The following should now be wired in order, placing the components so as to permit installation of shield can as indicated by dotted lines around *V4* and *L21*; *R8*, pin *6* of *V4* to *R9*, *C34*, mount *L21*, *C33*, and *C32*. Install shield can.

Next, mount potentiometer *R26* on front panel, and fasten latter to l.f. chassis. Wire shielded leads to *R26*, tie point terminal *11*, and connect *C48*. The complete routing of the shielded leads *X* and *Y* is not shown in the diagram, but they should run up near the top edge of the *L21* shield can. The starting point is at pin *1* of *V9*, near which the shield is secured by the ground connection shown near *C47*. The latter should be soldered to pin *5* of *V7* and to the shielded lead *X* running to terminal *c* of *R26*.

Mount output transformer at upper right rear corner of front panel, and connect its primary leads as indicated. For initial testing, connect the following with temporary leads: *R32*, power plug *P1*, and the loudspeaker (minus jack). These three components may be left unmounted at this time. Leads to the h.f. chassis are not required yet. Insert correct tubes, and the unit should now be ready for testing.

Set the tap on *R32* for maximum resistance, and then apply power via *P1*, as indicated in the diagram. After the tubes have heated, adjust *R32* until the *OA2* voltage regulator tube *V8* starts to glow.

Note: *R 32* should be placed and handled so as to minimize the possibility of accidental contact and shock.

Now, connect one end of a lead to either the blue or the red lead from the primary of *T1*. Connect the other end of the lead to the input of a radio receiver that will tune to 1750 kc. Tune the l.f. oscillator by adjusting the slug in *L21* until a signal is heard at this frequency. Disconnect the lead from the receiver and connect it to a signal generator operating at 1488 kc. A grid dipper may be used as the signal generator, or the lead from *T1* may be connected to an outside antenna if a local broadcast signal is available near this frequency. Connect a vacuum tube voltmeter, or other high resistance voltmeter, between ground and tie point terminal *3*. This point is the a.v.c. line and is at negative potential.

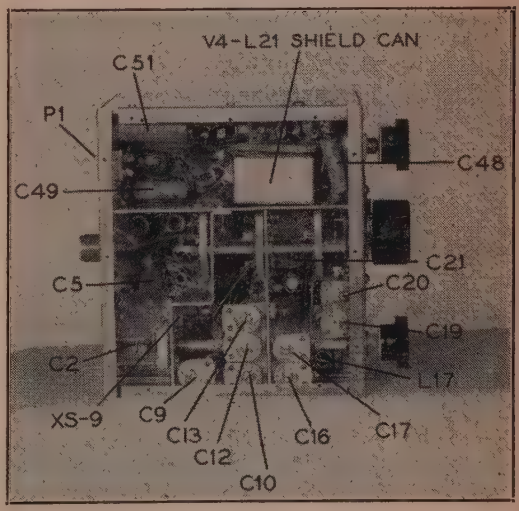
Adjust secondary trimmer of *T1* and top and bottom slugs of *T2*, *T3* and *T4* for maximum reading of the voltmeter. If a grid dipper is used for the signal generator, it may be coupled sufficiently to *T1* by placing its inductor near one of the input leads of *T1*. If it should be difficult to initially detect the generator signal with the voltmeter, the generator signal should be tone modulated so that the signal may readily be detected in the loudspeaker. A grid dipper may be modulated by applying tone through its phone jack. Modulation of the oscillator will also provide a check of the audio. Precise alignment, at this time, is not essential, since the purpose of pre-alignment mainly serves as a general test of the l.f. section to determine if it is functioning. This will avoid disassembly later for "bug chasing".

The high frequency chassis should now be assembled and wired. Make all r.f. connections as short as possible. Use pictorial diagram *Figure 6* as a guide. A rear view of the bandswitch decks and their designations is shown at the side of the diagram. Connect switch terminals *1F* and *6E* together. Also connect *1E*, *2E*, *3E* and *4E* together. Mount switch shield brackets, bandswitch, and tube sockets, securing grounding lugs with socket mounting nuts and screws.

Connect approximately 1/8" wide copper strap from switch terminal *2B* to ground lug screwed to chassis directly underneath switch terminal. Connect 1/8" copper strap from switch terminal *2D* to ground lug at socket of *V2*. Wire heaters and all ground lugs to their respective socket terminals. Connect *R7*, *C25* and *C23*. If space so requires, part of *C23* may rest on top of *C25*. Connect *C21* using #12 wire. Also use this size wire for the lead between *C21* and switch terminal *3E*. *C21* is mounted only by its leads, but additional support should be obtained by letting one corner of it rest on top of *C25*. Secure all three capacitors together with a few drops of Glyptal or Duco cement. This will reduce any tendency toward vibration. Connect *C30*; pin *1* of *V3* to *C29*, *C24* and *RFC1*. The latter should be mounted vertically with its top end connected to a ground lug near the top of the shield bracket.

Next wire pin *5* of *V2* to the National *XS-9* feedthru bushing on the side of the chassis, and tie point terminal *12* to *C27* feedthru and to tie point terminal *14*. Connect stator terminal of *C3A* to switch terminal *1D*. Also wire in *L15*, which should be mounted in a vertical position so that its tuning slug may be adjusted from the bottom of the chassis (all other slugs are adjusted from the top of the chassis). *L15* and its connecting leads should be made of one continuous piece of wire. Before soldering it in place remove its polystyrene form slug, so the soldering heat will not soften the material. This may be reinstalled after soldering.

Now connect *R6*, *C26*, *R5*, *C15*, *R2*, *C6*, *R3*, *C14* and *C7*. The latter, with its leads, should be kept free and clear of surrounding components and chassis elements in order to minimize stray capacitance. Connect stator terminal of *C3* to switch terminal *1B*, and wire pin *5* of *V1* to *XS-9* feed-



Bottom view. Upper portion is the low frequency chassis. The shielded lead, containing wires X and Y to the potentiometer R26, may be seen above the top edge of the V4-L21 shield can. The lower portion is the high frequency chassis. The left section is the r.f. stage, middle is the mixer, and right is the high frequency oscillator. At the upper left of the r.f. section is L2, with L4 to the right. Below these is the coax input lead to the bandswitch. Hardly visible under the coax is L6. L10 is just to the left of the middle of the switch deck, and L8 is below L10. RFC1 is just below C21.

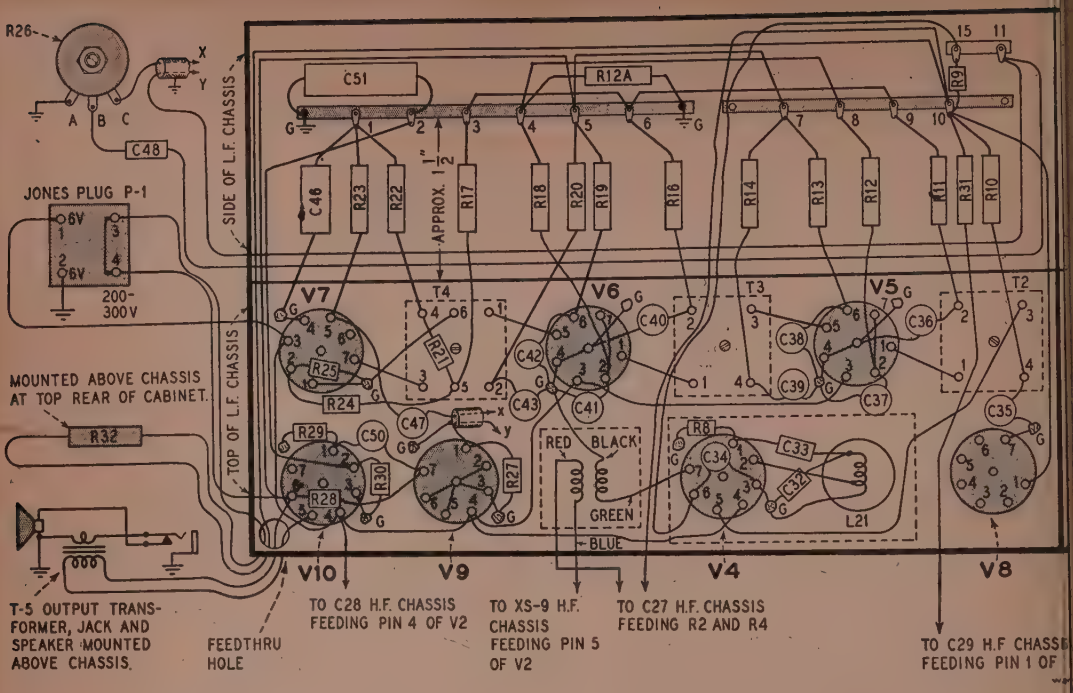


Fig. 5 Pictorial diagram showing placement of components and wiring in the low frequency chassis.

thru on shield bracket. Connect *R1, R2, C4, C6* and *C5.*

Mount one of the ceramic *LS-6* forms at point designated for *L10.* Then wind *L10* on another one of the forms, so that its leads will automatically fall in place at switch terminal *1B* and at pin *1* of *V1* when the inductor is slid on to the LS-6 form already mounted for *L10.* The tie rings, furnished with the LS-6 units are not used, since *L10* is supported by its connections with the form as a guide. Do not wind *L9* at this time. Connect *C2* only as shown. Its stator lead will have to run fairly high away from the chassis to clear the top of *L7-L8* when the latter is installed.

Next mount h.f. chassis to l.f. chassis and to front panel. It may be necessary to loosen the l.f. chassis from front panel during this operation. Connect leads from l.f. chassis to *C28, C27, C29* and XS-9 feedthru, as shown in *Figures 5* and *6.* Also install *R31* and *C31.*

For initial tests, the 4 mc band should be used, this being the one where signals may be heard most readily. Wind and install *L1, L2, L11, L16,* and *C52.* The ground end of the inductors is that nearest the chassis. Temporarily mount and wire trimmers *C9* and *C16,* as shown in *Figure 7.* Insert correct tubes in h.f. sockets.

Turn bandswitch to 4 mc position (maximum clockwise rotation), set main tuning capacitor at maximum, and *C2* at about half capacitance. If a grid dipper is available, use the following procedure: Adjust slug of *L2* until resonance is obtained at 3700 kc. Rotate main tuning capacitor to minimum. Resonance should now be obtained at about 4100 kc; however, if resonance is found at a higher frequency, rotate the tuning capacitor back to maximum and increase the capacitance of antenna trimmer *C2.* Then readjust *L2* slug to again resonate at 3700 kc. Again check frequency at minimum setting of tuning capacitor. These steps should be repeated until the range covers 3700 to 4100 kc. If the frequency is below 4100 kc when the tuning capacitor is first rotated to minimum, the foregoing procedure should be used, but instead decrease the value of *C2.* Follow the same steps in tuning *L11,* by adjusting its slug and trimmer *C9.*

The oscillator inductor *L16* should be adjusted in the same manner with trimmer *C16,* but the frequency range of the tuning capacitor should cover approximately 5200 to 5600 kc. Then apply power and, if necessary, readjust *R32* until the *OA2* glows. Remove plate potential from grid dipper and use it as an absorption type meter to detect whether or not the oscillator is functioning. This will be indicated by a rise in the meter reading when the grid dipper is coupled to *L16.*

If everything, so far, is functioning correctly, connect the antenna to switch terminal *1A,* and listen for 4 mc phone signals. Approximate retrimming of alignment may then be made, but preciseness is not required, as the main object is to determine if the complete receiver lineup is working.

If a grid dipper is not available, place an antenna lead from a communications receiver near *T1,* and listen for the h.f. oscillator beat in the 5200 to 5600 kc range. Then connect an antenna

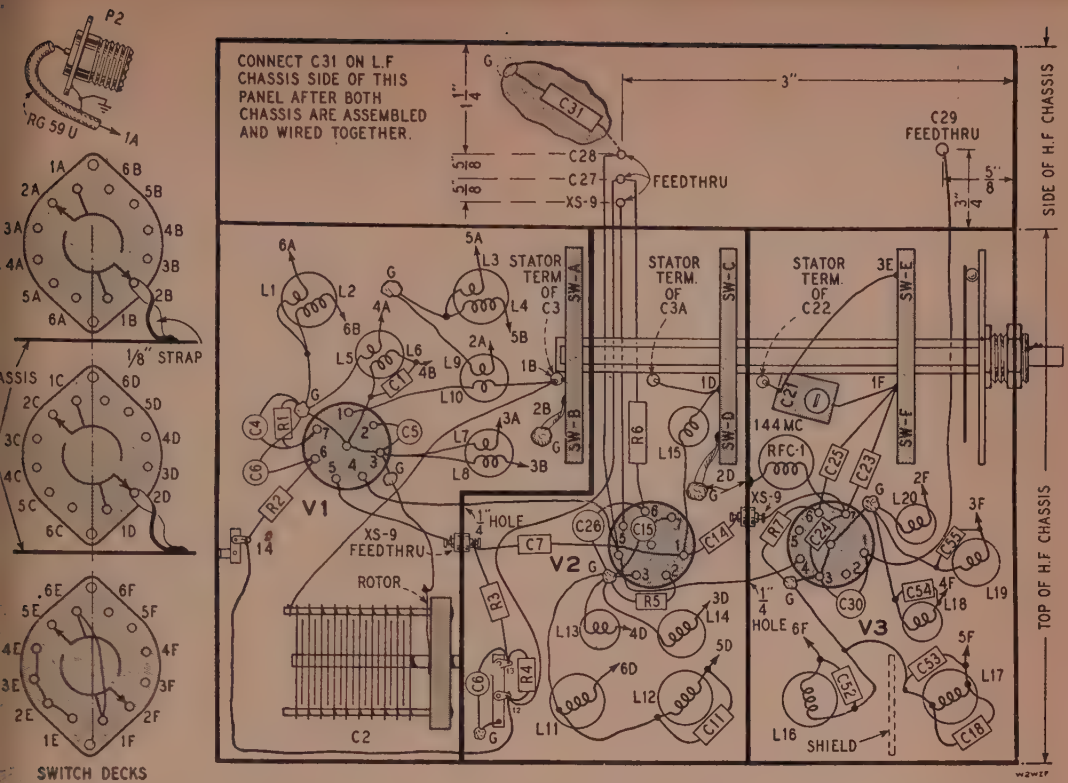


Fig. 6. Pictorial diagram showing placement of components and wiring in the high frequency chassis.

n series with a 50 uuf capacitor to the grid side of *L11*, and adjust slug and *C9* with incoming signal. Following this, connect antenna to input of r.f. tage and similarly tune the *L2* circuit. *C9* will equire slight retrimming.

When it has been found that the receiver works, emove all the 4 mc inductors and trimmers, so hat space will be available for easy installation f the higher frequency components.

The 144 mc inductors *L10* and *L15* have already een installed. Now wind *L9* around the bottom f *L10* as indicated in Figure 6. Also install the 44 mc band oscillator inductor *L20*. Place band-witch in the 144 mc position (maximum counter-lockwise), and adjust the oscillator frequency to over the approximate range of 71.25 to 73.25 mc, sing the methods described above for the 4 mc and. In this case, trimmer *C21* and the slug of *L20* re the bandspread adjustments. Since it is a eries connected trimmer, decreasing the capaci-ance of *C21* will increase the bandspread. In the bsence of a grid dipper, the oscillator frequency ay be determined by listening to its second har-onic, 142.5 to 146.5 mc, on another 144 mc re-eiver. An initial setting of the frequency may also e found by listening for it on a TV set tuned to he sound of channel 4 at 71.75 mc.

Alignment of the r.f. and mixer inductors *L10* nd *L15* may be made with a grid dipper, or by sing a signal generator, received noise, or other ignals. If a signal generator is used, its output should be maintained at a very low level so the receiver will not be overloaded with resultant confusing beats. If a grid dipper is used as the signal generator it should be placed several feet away from the receiver.

Set the antenna trimmer *C2* at minimum position. Connect a 144 mc antenna, or the signal generator to switch terminal *1A*, and reconnect the high resistance voltmeter to a.v.c. line at the point terminal *3* (l.f. chassis). With generator set at 145 mc, rotate tuning capacitor until the signal is registered by the voltmeter. Adjust slug of *L10* for maximum reading. Next, change generator to 146 mc and rotate tuning capacitor until this frequency is detected. Then adjust slug of *L15* for maximum reading.

If *L15* cannot be peaked by moving the slug, it may be necessary to slightly squeeze or spread the turns of the inductor, since the position of the brass slug will only vary the inductance over a very small range. The polystyrene form holding the slug should be cemented to the inductor after alignment has been completed.

When the signal generator or the antenna has been removed, rotate *C2*, with the main tuning capacitor set at different positions, and note if spurious oscillator beats, or excessive tube hiss can be heard. *C2* with its connecting lead will form a series resonant circuit in the 144 mc band at intermediate settings of *C2*. Improper adjustment of the *L10* slug may also cause some instability.

The correct adjustment is maximum signal with *C2* set at minimum and no evidence of instability. *L10* slug may require resetting with different input loads or antennas.

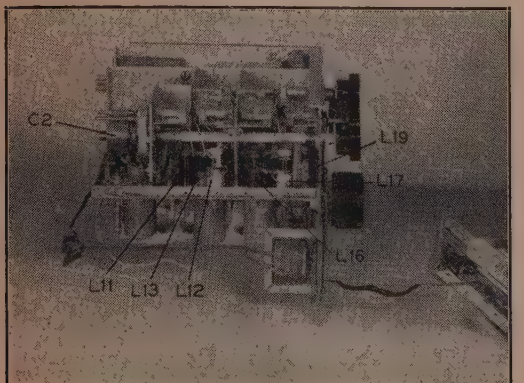
Next, for the 50 mc band, mount LS-6 forms for *L8* and *L14*. Their inductors should then be wound and installed in the same manner as was *L10*, by forming them first on a separate LS-6 form, so that the complete inductor, with its terminating leads, may be slid over the mounted forms with the leads automatically falling at their points of termination—ground and proper switch point. *L7* may be wound around the bottom of *L8* after the latter has been installed. Connect *L7* to switch terminal *3A* and ground. Mount and connect *C13, C20, C55* and *L19*. The latter should be wound directly on its form, before mounting, and the winding should be soldered to the tie rings furnished with the forms.

Place bandswitch at the 50 mc position and align circuits as described earlier for 4 mc. For the 50 mc band, the h.f. oscillator should tune from approximately 24.25 to 26.25 mc, the second harmonic falling between 48.5 to 52.5 mc. This is set by adjusting *L19* and *C20*. The r.f. and mixer circuits should be adjusted with *L8, C2, L14* and *C13*.

Now install *L5, L6, L13* and *L18* in the same way the 50 mc inductors were handled above. Mount and wire *C12* and *C19*. Also install *C54*. Connect *C1* directly across the leads at *L6*. Normally *C2* alone would resonate the 28 mc circuit without the benefit of *C1*, but the latter is neccessary to detune the self resonance of *L6* when the bandswitch is set for 144 mc operation. Unless *C1* is used as directed the self resonance of this inductor will trap out the 144 mc signals since *L10* (144 mc r.f. inductor) is mounted next to *L6*. The h.f. oscillator for the 28 mc band should be adjusted to cover 14.25 to 15.75 mc, the second harmonic falling between 29.5 to 31.5 mc. Align all circuits, as described earlier for 4 mc, by adjusting slugs and trimmers.

For the 14 to 14.4 mc band, install *L3, L4, L12* and *L17*. Except for *L3*, these inductors should be wound with the ends of the windings soldered to the tie rings furnished with the forms. *L3* is soldered directly between ground and its switch

Side view of the receiver looking at the high frequency chassis.



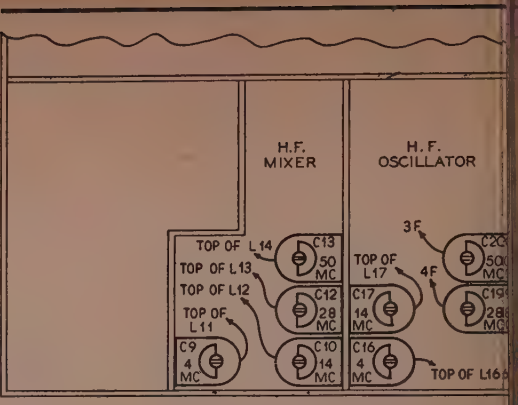


Fig. 7. Location and wiring of trimmer capacitor The rotors are all connected to ground, while th stators are connected as indicated.

terminal. Mount and wire *C10, C17, C11, C1* and *C53*. Align circuits as for the 4 mc band wit high frequency oscillator tuned to cover 7.75 t 7.95 mc, and second harmonic 15.5 to 15.9 mc.

Finally, install the 4 mc components *L1, L2 L11, L16, C9, C16* and *C52*. Mount 4 mc oscillato shield, (not shown in photos) by securing it wit the *L16* form, and position it so that it is betwee *L16* and *L17*. Align circuits as described earlie Then coat all inductors with coil dope.

Mount rear panel and install antenna input re ceptacle *P2*, connecting it to switch terminal *1* with a short piece of coax. Mount and wire powe plug *P1* and resistor *R32*. Jack *J1* should also b mounted on rear panel, and should be now wire Connect *C49* (not shown in pictorial diagram between ground terminal of *P1* and pin *1* of *V9* Mount loudspeaker, sides of cabinet and botto plate. Before mounting the latter, holes should b drilled in it to permit access for screw driver ad justment of the trmmers.

Before calibrating the receiver, the pointer o the MCN dial should be removed and bent s that it rides almost on the surface of the scale face This will reduce erroneous parallax readings. The lucite pointer must be heated before it can be bent Heating may readily be accomplished by holding the lucite over a soldering iron, but be careful no to let it touch the iron.

The final step is precise alignment and calibra tion. Following calibration, a few drops of Glyptal or Duco cement, should be applied to the slug screws above the chassis to prevent their shifting under vibration.

An on-off switch has been omitted from the set in favor of placing it nearer the power supply in order to eliminate the need for additional length of the 6 volt leads to the latter. As the receiver is now installed, the heaters are energized by a switch in a separate control box. The vibrator power supply is energized through a relay which opens the circuit during transmissions and thereby reduces battery drain.

Four of the Norwalk Red Cross 28 mc walkie-talkies. Note that two different styles of fishing tackle boxes are used. Cables for the handset are plugged into the chassis through holes in the side of the box.

The CD 28 MC Walkie-Talkie

P. S. RAND, W1DBM*

The addition of several Walkie-Talkie units to any CD organization will undoubtedly prove to be of tremendous value. Many situations will be encountered where the 28 mc mobile cannot be brought close to the scene of the disaster. Using one of the Walkie-Talkies described by W1-DBM the second operator may continue on foot and still maintain radio contact with the mobile and net control stations. Give this unit every consideration in your plans for a complete CD communications network. —Editor

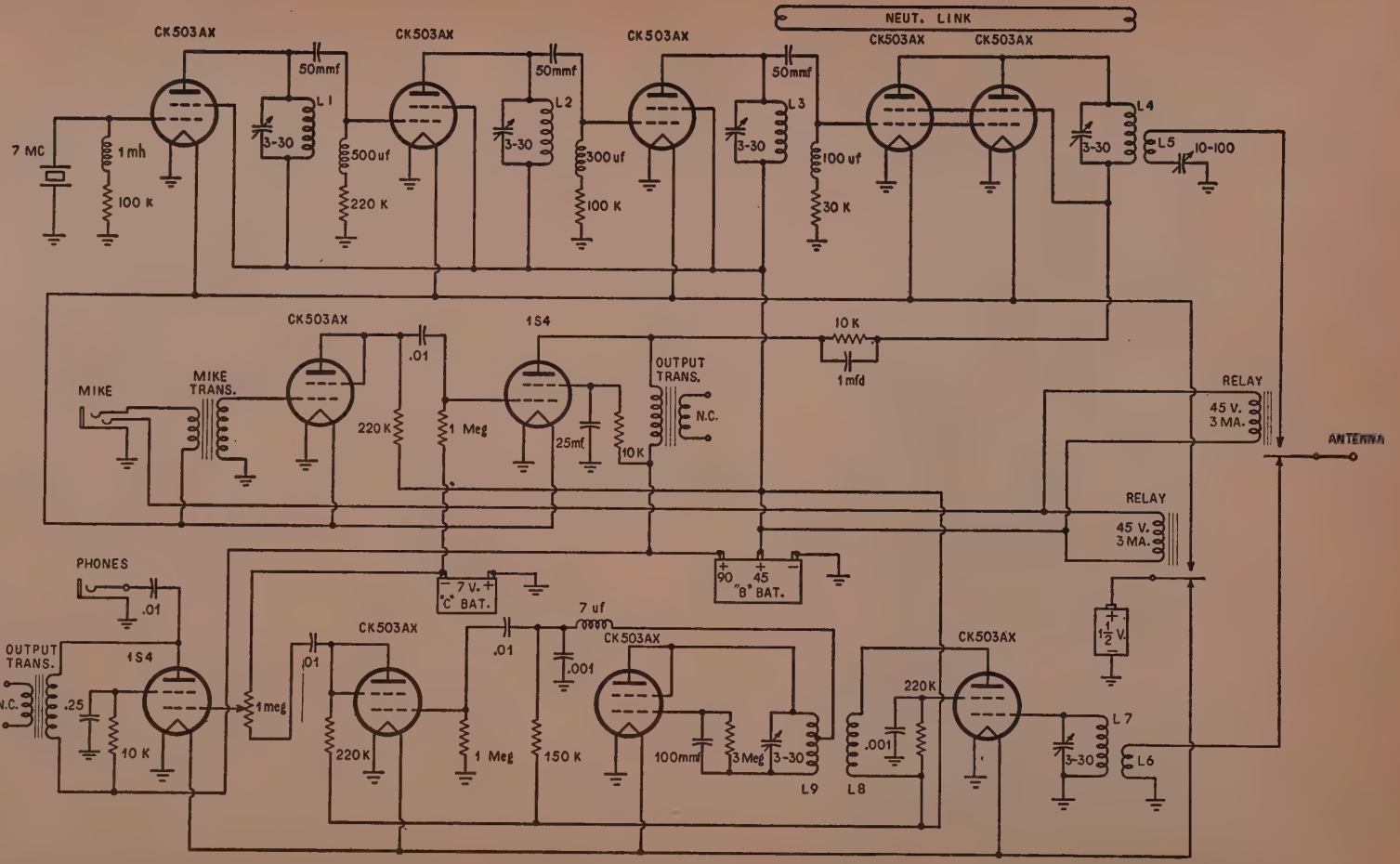
HERE IN NORWALK, we have for some time felt the need for several "Walkies-Talkies" in our Red Cross Disaster Communications system. The 28 mc mobile units have worked out fine at general alarm fires, floods and wind storms; however, their mobility has often been restricted due to fire hose lines, flooded streets and roads blocked by fallen trees. If we had low power, battery operated units with a range of one-half to one mile, we could have crossed these road blocks on foot and established communications right at the scene of the disaster.

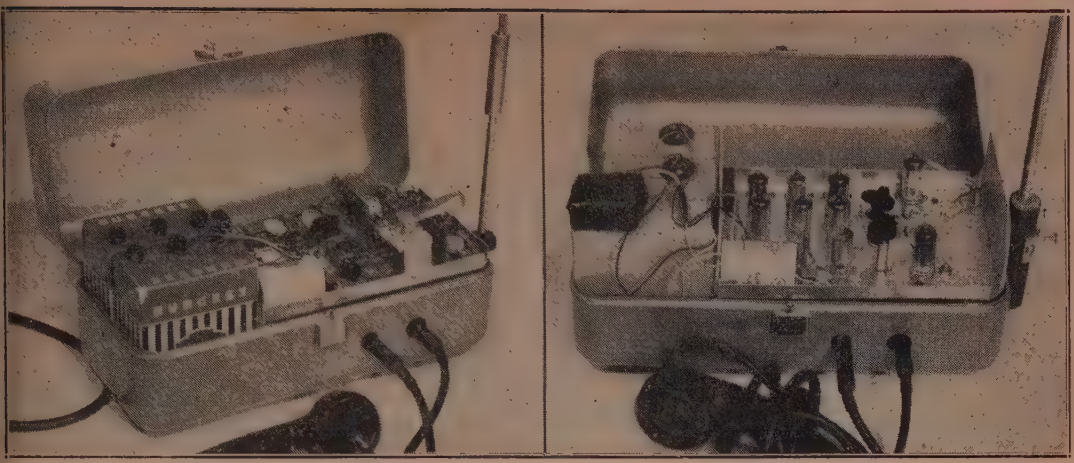
The walkie-talkie equipment should meet the following specifications:

1. Rain and dust proof.
2. Must be light weight and easily hand carried.
3. Must have sufficient power to be heard by a mobile receiver for one-half to one mile.
4. The receiver must have sufficient sensitivity to receive a 5 or 10 watt mobile for several miles.
5. The receiver should have some sort of AVC action as well as noise limiting.
6. Must have easy access to batteries and it should use standard type of batteries. Battery life in intermittent use should be at least 20 hours, preferably longer.
7. Should be operated by push-to-talk button on the telephone handset.

The equipment to be described met specification 1 through the use of a fishing tackle box of "drawn" construction, making it inherently rain proof. Miniature tubes and parts satisfied specification 2. After considerable experimenting and testing, it was found that a plate input of 150 mw. could be heard reasonably well—on a 28 mc mobile converter—at distances up to one mile. Additional testing of several different types of receivers for maximum economy of battery life, adequate sensitivity, together with an AVC and noise limiting section, indicated that a super-regenerative detector with an r.f. stage would fill the bill. Inasmuch as, both subminiature and standard 1¼ volt tubes were available, two different types of units were constructed with only minor changes in the circuitry.

*Laboratory of Advanced Research, Remington Rand, Inc., South Norwalk, Conn.


NEUT. LINK
CK503AX
CK503AX
CK503AX
CK503AX
CK503AX
CK503AX
7 MC
1 mh
100 K
50mmf
L1
3-30
500uf
220 K
50mmf
L2
3-30
300uf
100 K
50mmf
L3
3-30
100 uf
30 K
L4
3-30
L5
10-100
CK503AX
1S4
.01
MIKE
MIKE TRANS.
220 K
1 Meg
25mf
10K
OUTPUT TRANS.
N.C.
10 K
1 mfd
RELAY
45 V.
3 MA.
ANTENNA
RELAY
45 V.
3 MA.
PHONES
.01
7 V. "C" BAT.
90 45 "B" BAT.
7 uf
1½ V.
OUTPUT TRANS.
N.C.
1S4
.25
10 K
1meg
.01
CK503AX
220K
1 Meg
.01
.001
150 K
CK503AX
100mmf
3 Meg
3-30
L9
CK503AX
220K
.001
L8
L7
3-30
L6



Lifting the lid on the subminiature model (left) and the standard miniature tube model (right).

Circuit

Referring to *Figures 1* and *2* it will be noted that the circuit diagrams are conventional and might be that of 150 watt transmitters instead of 150 milliwatt portables. The transmitter using subminiature tubes starts off with a CK503AX crystal oscillator on 7 mc followed by a doubler to 14 mc and another doubler to 28 mc, which drives a pair of CK503AX's in parallel as a neutralized final. In order to get enough modulating power we resorted to a 1S4 miniature pentode as a class A modulator, driven by a CK503AX triode connected speech amplifier. The entire r.f. section operates on 45 volts, the exciter drawing about 3 ma and the final about 4 ma. The modulator operates on 90 volts at about 6 ma and has its own 7½ "C" battery. The total filament drain while transmitting is about 300 ma at 1½ volts.

Switching from receive-to-send is accomplished by a 5000-ohm double-pole, double-throw relay that operates at 4 ma from the 45 v "B" battery. This relay switches both the antenna and the 1½ v filament battery from receiver to transmitter when the microphone button is pushed.

The subminiature receiver section uses three CK503AX's as r.f. amplifier, super regenerative detector, and first audio followed by a 1S4 which drives the earphones in the handset. The detector and first audio CK503AX's are triode connected. The receiver draws a total of only 8 or 9 ma at 90 volts which will be the only drain on the "B" batteries for about 90% of actual operating time. The receiver filament drain is approximately 200 ma at 1½ volts. One large standard size flashlight cell is adequate for handling the filament; however, provision could easily be made for mounting two or more in parallel for longer operation. At any rate, several spares should always be carried.

Tubes

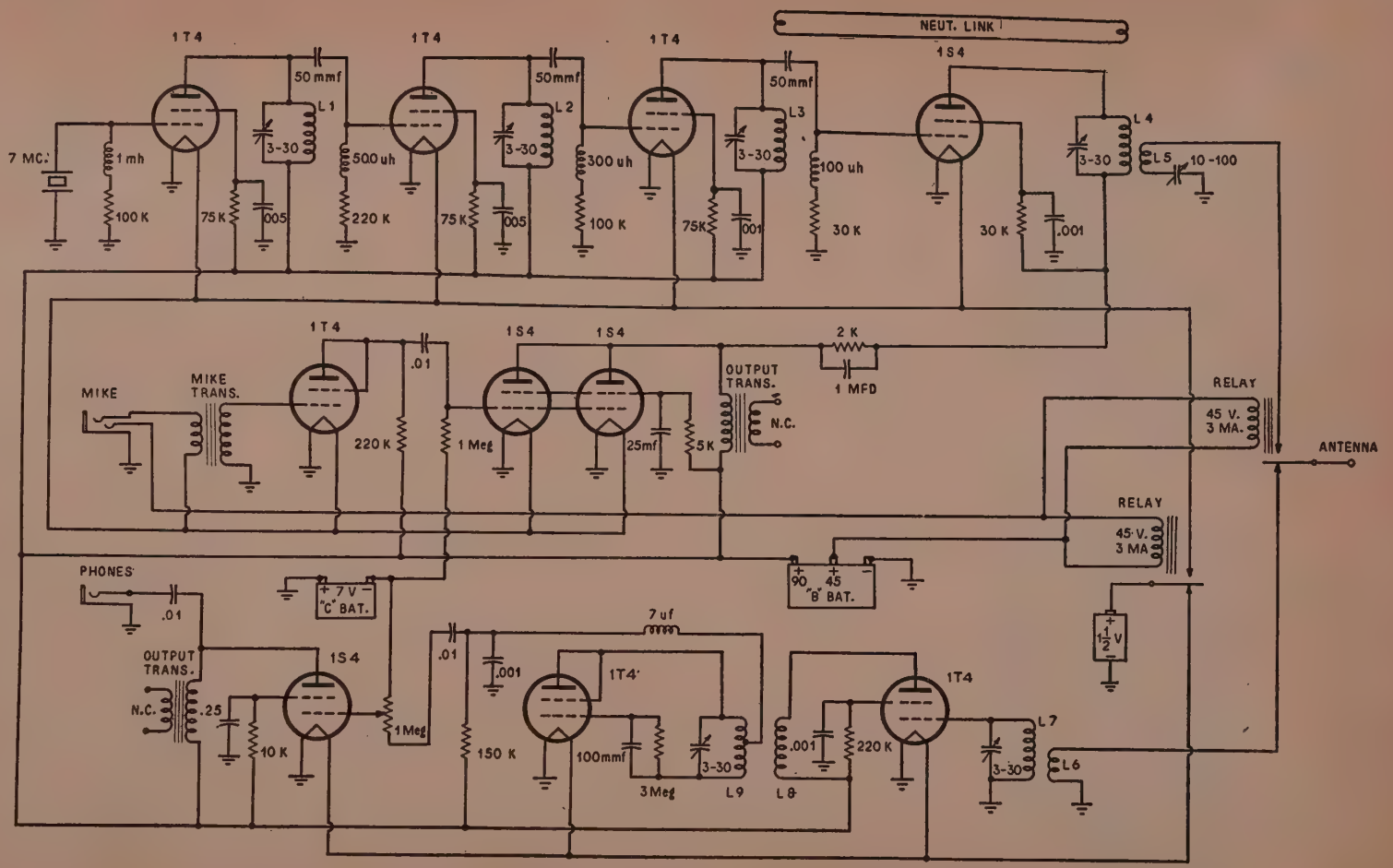
The CK503AX is a subminiature pentode power amplifier designed for use in hearing aids and was used because a few were immediately available. Other types might be more suitable if they can be obtained, such as the CK5672 or the 1AD4. A good triode would be the CK573AX. Data on these tubes, and others that might be substituted for them, appears in the Tube Section of the ARRL Handbook. In general, select pentode power amplifiers that are designed to operate at 3 to 8 ma with 45 to 90 volts on their plates. They should have instant heating filaments rated at 1½ volts at 30 to 100 ma in order to keep the overall battery drain as low as possible. If you intend to build a walkie-talkie for 144 mc you could, for example, start off with a CK5672 crystal oscillator on 8 mc, another tripling to 24 mc, a 1AD4 tripling to 72 mc, a CK573AX triode doubling to 144 and a CK573AX triode final. Although I have never used this tube line up, it is employed in some of the well known commercial jobs. For a class A modulator use one of the following: 1S4, 3A4, 3B4, 3Q4, 3S4 or 3V4, etc.

Construction

Both models were designed to fit the same size "fishing tackle" box once the drawer had been removed. The transmitter-receiver chassis was designed to have clearance on all sides so that any rain leaking in the joint between the cover and the bottom section of the box would run harmlessly into the bottom where drainage holes have been provided. Any holes in the cover, especially around the handle, should be carefully soldered up to prevent leaks.

Several different chassis have been tried all with equal success. These varied all the way from thin plywood and bakelite to the aluminum construction now in use. The main idea is to place your batteries in one end of a fishing tackle box, mount a 63 inch automobile broadcast receiver type of whip antenna on the other end, and then "cook up" a chassis to fit the remaining space. As

←— Fig. 1. Circuit schematic of the 28 mc Walkie-Talkie using subminiature tubes.


NEUT. LINK
1T4
1T4
1T4
1S4
50 mmf
50mmf
50mmf
L1
L2
L3
L4
L5
3-30
3-30
3-30
3-30
10-100
7 MC.
1 mh
100 K
75K
.005
500 uh
220 K
75K
.005
300 uh
100 K
75K
.001
100 uh
30 K
30 K
.001
1T4
.01
1S4
1S4
2 K
1 MFD
MIKE
MIKE TRANS.
220 K
1 Meg
25mf
5K
OUTPUT TRANS.
N.C.
RELAY
45 V. 3 MA.
ANTENNA
RELAY
45 V. 3 MA
PHONES
.01
7 V "C" BAT.
90 45 "B" BAT.
1½ V
7 uf
OUTPUT TRANS.
N.C.
1S4
.25
10 K
1 Meg
.01
.001
150 K
1T4
100mmf
3 Meg
3-30
L9
L8
.001
220 K
1T4
3-30
L7
L6

← Fig. 2. Circuit schematic of the Walkie-Talkie using standard battery miniature tubes.

shown in the photos, it is convenient if the end plates of the chassis extend above, as well as, below the top of the chassis so that the unit may be worked on in any position without damaging tubes or parts. A small front panel should be provided to hold two jacks for the mike and phones. No dimensions are given as fishing tackle boxes will vary in size from one manufacturer to another.

In the subminiature tube model, all r.f. components of both transmitter and receiver are mounted on strips of bakelite above the chassis. The 1S4 modulator and 1S4 receiver audio tubes, together with their transformers and the S/R relay, are mounted under the chassis. Room is left at one end of the box for the two 45 volt "B" batteries.

The miniature tube model follows standard layout and mounting practices. Because all the r.f. components are under the chassis, the transformers and relay are mounted on the inside ends of the chassis.

Mounting subminiature tubes at first presented quite a problem. It was solved quite nicely as shown in *Fig. 3 (c)*. First a thin strip of copper is attached to the center of the chassis. All grounds are soldered to this strip. Next a strip of $\frac{1}{16}$ inch thick bakelite is fastened to each side for insulation. Last, a slightly narrower strip of the same bakelite serves as the mounting for all the tubes, condensers, and coils in the circuit. The tubes are mounted to this last strip by inserting their filament and screen grid leads through three small holes drilled for the purpose and then tying the tubes down with #24 enameled wire through four other small holes. The filament and screen leads are pulled tight and bent up around the edge of the bakelite ready to be soldered into the circuit. All tube leads have thin spaghetti tubing slipped over them and are used as the hookup wires, as far as possible. All the coils and condensers are soldered between two lugs held to the top piece of bakelite by small screws. One side of each filament, and all by-pass condensers, are soldered directly to the copper strip in the center between the transmitter and receiver sections.

The 7½ volt "C" bias battery is made by soldering five 1½ volt "pen light" cells in series and then taping them up with scotch tape. These are tucked away in any convenient corner of the box. The 1½ volt filament battery is held in a homemade clamp, shown in *Fig. 3 (d)*. In the case of the miniature tube model, six 1½ volt batteries are soldered together in parallel for added longer life.

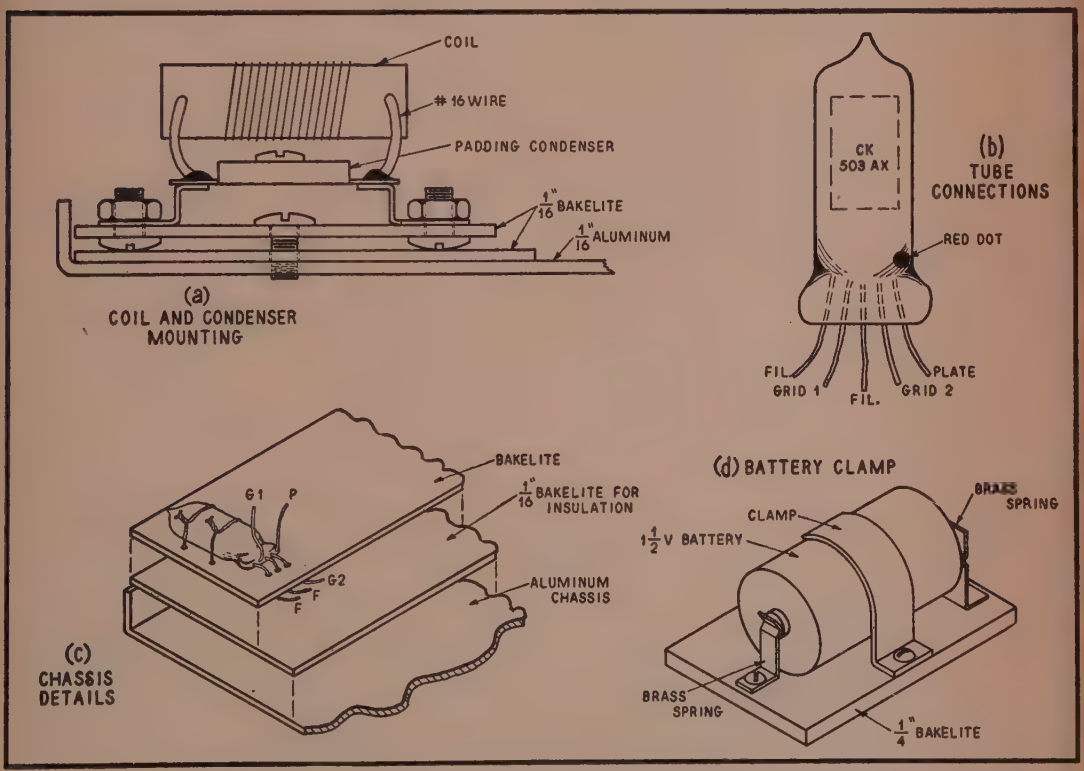
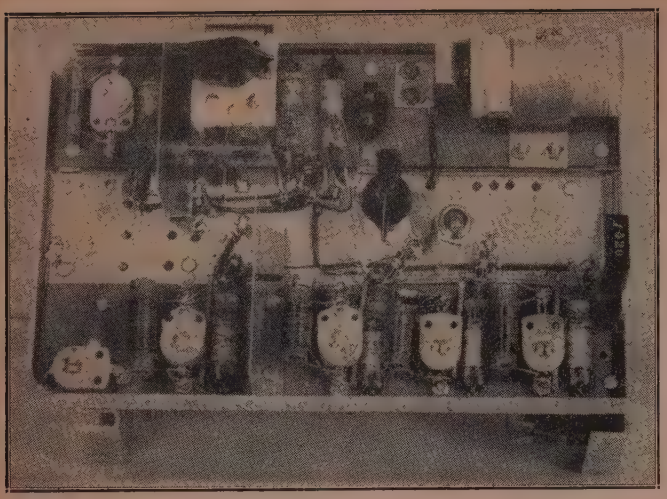


Fig. 3. In this composite drawing, (a) shows the method of mounting the coil and condenser combination. (b) shows the tube connections of the subminiature CK503AX. The sandwiched type of construction is shown in (c) The wire leads for the subminiature tubes are fed through small holes. The tube is tied into place with pieces of No. 24 enameled wire. A homemade battery clamp for the usual flashlight type cell is shown in (d).



The top side chassis view of the subminiature model showing the methods of mounting the tubes, coils, and condensers. The audio volume control is mounted alongside the filament switch. The receiver tuning condenser is mounted in the upper left center.

Antenna

The cheapest type of 63" auto radio telescoping whip seems to be satisfactory. A base loading coil has been tried without marked improvement. A mobile 8 foot whip is too unwieldy for a hand carried portable. The antenna is mounted with the insulators that come with it and a piece of hookup wire is connected from the bottom insulator to the antenna terminal point on top of the chassis. This terminal point is then wired through the antenna relay to the antenna coil and loading condenser. If it is desired to remove the antenna for storage, a short piece of brass rod, the same diameter as the base of the whip, may be mounted in the antenna insulators. The whip is inserted in a type of shaft coupler. This coupling, shown in the photos, is a short length of brass drilled out to fit both the antenna and the brass rod mounted in the insulators. Two 8/32 set screws hold the assembly in place.

Coils and Condensers

Coil sizes are given in Table I and are approximately the same for both models. They are wound as indicated on ⅜" diameter bakelite tubing and are soldered directly to the condensers with No. 16 tinned wire.

Tuning up

The tuning up procedure is straightforward. Each stage of both transmitter and receiver is checked with a grid dip oscillator and tuned to the correct crystal frequency, or harmonic thereof. The resistance from plus B to ground is measured with an ohmmeter to be sure there are no shorts across the battery and, if not, the batteries are connected. With the phones plugged in, the super-regen hiss should be heard. If not, check for trouble, such as; too tight coupling between the r.f. plate coil and the detector, or perhaps the r.f. stage is oscillating. (A mysterious dead spot on the first model turned out to be the signal radiated by the high frequency oscillator of my regular communications receiver.)

After the receiver has been checked out, the transmitter may be energized by holding the send-receive relay in transmit position by sticking a piece of folded paper under the armature. With the minute amount of power involved, the best way to tune it up is by watching the "S" Meter on the regular communications receiver. With this receiver set to the 7 mc frequency of the crystal, the oscillator may be tuned until the crystal breaks into oscillation. It is then tuned for maximum "S" meter reading. The receiver is switched to 14 mc and 28 mc in succession as each of these stages is tuned for maximum "S" reading. If any instability is noticed when tuning up the final, or if the final continues to oscillate when the crystal is removed for a moment, it indicates that the final needs neutralizing. Probably the easiest method is to use inductive or link neutralization. A small two turn link is wound over the cold end of the 28 mc doubler plate coil and connected with twisted leads to a two turn link that may be moved close to the cold end of the final coil. If the oscillation gets worse this latter two turn link is reversed 180 degrees and

(Continued on page 60)

COIL	INDUCT.	DIA.	LENGTH	NO. TURNS	ENAMELED WIRE SIZE
L1	23 uh	3/8"	5/8"	70	#32
L2	7.7 uh	3/8"	9/16"	40	#28
L3	1.2 uh	3/8"	9/16"	17	#20
L4	3/5 uh	3/8"	5/8"	18	#20
L5		3/8"		3	#20
L6		3/8"		4	#20
L7	2.5 uh	3/8"	1/2"	23	#24
L8	5 uh	3/8"	7/16"	32	#28
L9	2.5 uh	3/8"	1/2"	23 C.T.	#24
NEUT LINK		3/8"		2T	HOOK UP WIRE

TABLE I: Walkie-Talkie Coil Data
All r.f.c. units are 1 meg., 1 watt carbon resistors wound full of #40 enameled wire..

Radio as a Hobby in the Navy

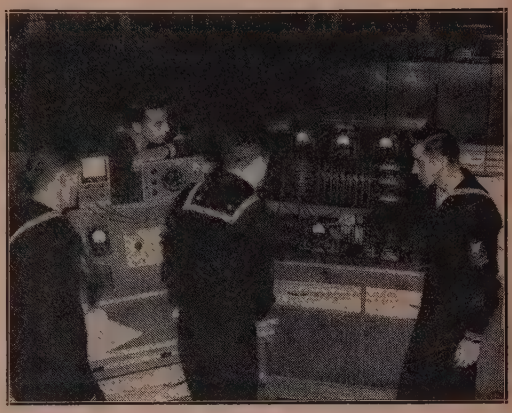
Cmdr. E. L. BATTEY, USNR, W4IA*

THE NAVY'S "Hobby Craft" program has been rapidly growing since the close of World War II. Emphasis on handicraft came at the war's end, when thousands of Navy men found extra time on their hands. Hobby shops have multiplied in number and sometimes in size. One shop was opened that will accommodate 700 hobbyists at one time.

Under today's program, the Bureau of Naval Personnel in Washington helps set up handicraft shops on every ship and station desiring one. All details of planning-specifications, instructions, plans, lists of materials, tools and supplies for 30 hobbies, as well as aid in organizing the shop—are available to Navy commands. This is particularly true in the case of radio. The "Hobby Craft Manual on Radio" gives detailed instructions on building simple receivers, amplifiers, miscellaneous electronics equipment and even a low-power transmitter. Also included is elementary information on radio symbols, the radio frequency spectrum, abbreviations, and component parts used in radio work. The manual is intended to familiarize the uninitiated with basic radio information as an introduction to the development of radio as a hobby. For the individual interested in breaking into the radio and electronics fields, participation in the Navy's hobby shop program can be a first step.

As knowledge and experience is gained, the radio beginner goes on to more advanced opportunities. The objective of many radio hobbyists is to obtain an amateur radio operator's license and to "get on the air" to communicate with fellow amateurs the world over. Groups of Naval personnel may form an amateur radio club. Members of these groups sometimes pool their resources and establish a station in the name of the club. This is often the case at Naval activities where interest in radio as a hobby is high. Such club groups not only operate their stations, but they conduct construction and experimentation projects, and assist newcomers in qualifying for amateur operator licenses.

*2008 N. Cleveland St., Arlington, Va.



Power in parallel circuits being explained by use of circuit demonstration panel.

The Navy encourages participation in amateur radio as a recreational activity. From a morale standpoint, amateur radio offers much to the Navy man away from home. Within the limits of the regulations under which his license is issued, he is often able to remain in close contact with his home. There is an additional factor which makes amateur radio outstanding—the educational and training benefit to the individual. It is because of this aspect that particular encouragement is given to amateur radio at Naval Reserve training activities where communications and electronics training is conducted. More that 60% of the 800 Naval Reserve Training Centers, Electronics Facilities, and Electronics Stations throughout the United States, and in Alaska, Hawaii, and the Canal Zone, have amateur radio stations. The Federal Communications Commission gives special recognition to these stations by assigning distinctive call letters, which identify them as being associated with the Naval Reserve program.

Naval Reserve Training supplies Hobby Shop facilities for a background in amateur radio. Left: Tube checking at the Valparaiso USNR Electronic Facility 9-170. Center: Receiver repairs at NRTC, New Orleans, La. Right: An equipment check at NRTC, San Antonio, Texas.

Performance of the
Terminated Folded Dipole

G. L. COUNTRYMAN, W3HH*

Every once in awhile an antenna comes along that could be put to good use by the average amateur. The Terminated Folded Dipole (also known as the T2FD) is just such an antenna. Unfortunately, it has not been given its due publicity. This article is designed to clarify some of the points on the construction, as well as, report upon experimental results. —Editor.

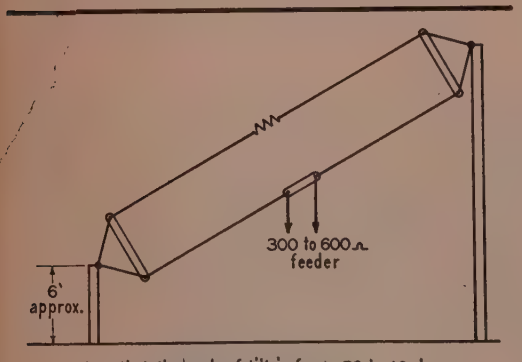
INITIAL EXPERIMENTS with a terminated tilted folded dipole antenna were described by the author some two years ago.[1] This antenna has omnidirectional characteristics and a 5 or 6 to 1 frequency ratio which means that one "untuned" antenna is all that is required for operation on from three to five amateur bands.

The antenna has a definite application in connection with emergency communications in the lower frequency bands.

1. One antenna is all that needs to be erected for operation on several bands.
2. Only one elevated point (pole, tree or house gable) is required
3. Less space along the ground is needed for any given frequency as the flattop portion is shorter than the usual one-half wavelength.

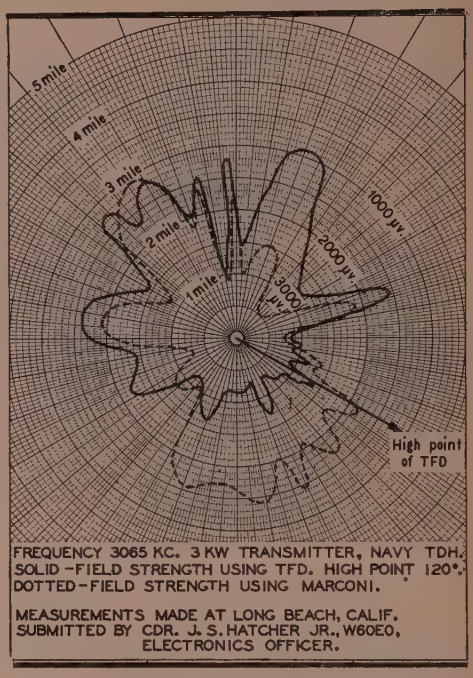
Basically, the antenna is the hypotenuse of a right angle triangle, one leg of which is along the ground, as shown in *Fig. 1.* The spacing between the folded dipole wires, in feet is equal to 3,000 divided by the frequency in kilocycles, and the result multiplied by 3.28. The length of each leg in feet (from either end to the center insulator or resistor) is equal to 50,000 divided by the frequency in kilocycles, and the result multiplied by 3.28. The terminating resistor should have a wattage rating equal to 35% of the power input to the final stage, and should have a resistance equal to the impedance of the two wire feeder system—usually 600 ohms.

*Capt., USN, 309 Windsor St., Silver Spring, Md.



Erect so that the angle of tilt is from 20 to 40 degrees for omnidirectional operation.

Figure 1



FREQUENCY 3065 KC. 3 KW TRANSMITTER, NAVY TDH.
SOLID—FIELD STRENGTH USING TFD. HIGH POINT 120°.
DOTTED—FIELD STRENGTH USING MARCONI.

MEASUREMENTS MADE AT LONG BEACH, CALIF.
SUBMITTED BY CDR. J. S. HATCHER JR., W6OEO,
ELECTRONICS OFFICER.

Figure 2

During the past few months the response has indicated that there is considerable interest in, and several applications successful of the T2FD antenna. Some criticism from the theoretical gentlemen who dismiss the practicability with the statement; "It won't work," has also been received.

As far as the author is concerned, work on the antenna has progressed spasmodically, due to the

(Continued on page 52)

The two operators of PX1A pause between contacts. EA3HE at the Left and EA3FL on the Right.

A Legitimate PX1A

ROMULO ALEU, EA3FL*

and

MARIO FLAQUE, EA3HE**

UNTIL THE ADVENTURE by 7B4CF in June 1951, the Principality of Andorra was unknown in the amateur bands. Unfortunately, these circumstances opened the way to several attempts at "pirating" the PX call sign. However, all of these attempts were discovered. As a result of this unhappy situation we decided to give as many amateurs as possible, the opportunity of working and confirming a PX call.

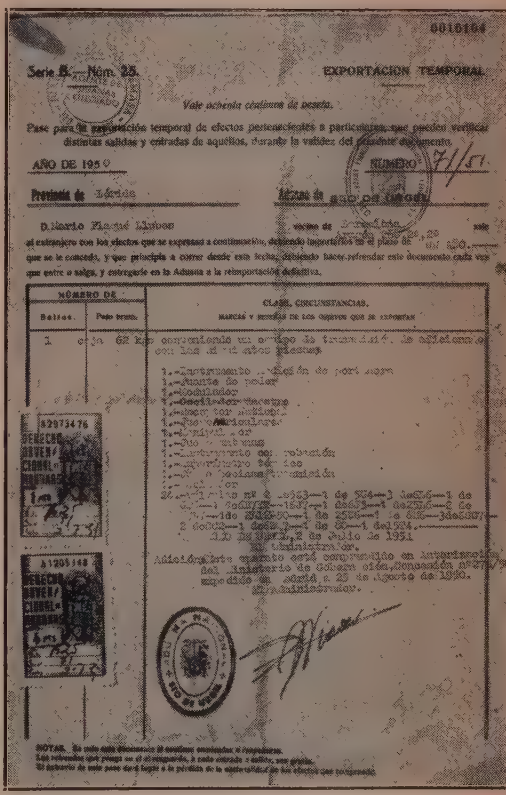
For historic reasons, the Principality is governed by the Bishop of La Seo de Urgel (Spain) and the Prefect of Pyrenees (France). Andorra, itself, has no finite code of laws. This is the principle obstruction to amateur radio activity. Justice in the country is exercised by two *Veguers*, nominated by the representatives from France and Spain. The capitol of the Principality is Andorra la Vieja. While there are no existing laws to regulate amateur radio, there are on the other hand, no prohibitions against the operation of amateur radio stations. We were most cordially received and we would like to thank the Bishop of La Seo de Urgel (Prince of Andorra); the General Vicary; the Commissary of Police; and Mr. Sansa, *Veguer* of Andorra.

The topographic features of Andorra are extremely rugged and we were unfortunately set up in a valley with a natural obstruction extending 1800 feet over our heads. This sheer rock wall nearly always rejected our signals and prevented us from making contacts with countries between azimuths of 260° and 340°. On the other hand we received extremely nice reports from Asia and Oceania indicating that the aforementioned obstacle probably acted as a sort of reflector. DX conditions towards South America were also excellent. This direction coincided with that of the valley's depression. QSOs with Europe were quite easy.

We lived in the Meritxell Hotel which was situated at the end of the electric power line. Due to the poor voltage on the line we connected the primaries of the power transformers to the 100 volt taps. An unexpected change in the line voltage indicated that we had not chosen the best system for a remedy of our trouble. However, once the damage was repaired, transmissions were continued until the same fluctuation in voltage was repeated. Needless to say, we then reconnected all primaries to the 125 volt tap. Frequent storms in the Pyreean countryside also interrupted many transmissions. The input of our transmitter was about 20 watts during the daytime and about 70 to 80 watts during the night.

A review of our log book, which has been deposited with the U.R.E., Madrid, Spain, indicates that we were on the air for 23 days. We commenced operations on July 3rd and closed the station on July 26th. We made 1,034 QSOs and operated on 40, 20 and 10 meters. Sixty percent of our QSOs were on c.w. Unfortunately, the rock wall to our northwest prohibited work with North America, and only six contacts were made with W stations. All contacts have been QSL'd through the Bureau.

(Continued on page 56)



0010104

Serie B.—Núm. 25. EXPORTACION TEMPORAL

Vale ochenta céntimos de peseta.

AÑO DE 1950

NÚMERO 71/51

Temporary Export Permit listing the equipment taken to Andorra.

*Riera Alta 35 y 35, Barcelona, Spain

**Aragon 268, Barcelona, Spain

Conducted by LOUISA B. SANDO, W5RZJ*

HAMS IN THE West Gulf Division got together at Austin, Texas, on August 18-19 for their annual convention. Out of the 600 registrations there were 12 YLs! Those attending: W5EUG, Lillian Hall, of Houston; W5BKG, Ethel Henderson, and W5QXR, Marge Smith, both of Corpus Christi; W5OQT, Sue Snarr, of Oklahoma City; W5OTU, Anne Maring, of Brownsville; W5DUR, Bruce Groves, of Odessa; W5RYX, Lyn Ohlson, of Dallas; W5SPV, Pat Truitt, of Grand Prairie; W5PDU, Topsy Morgan, of Baton Rouge; W5JAD, Ethel Eller, of Pampa; W5SNL, Fran Miller, of Ardmore; and W5PYK, Bea Faubion, of Austin.

The main event for these YLs was a breakfast held Saturday morning at the Commodore Perry Hotel, with W5PYK, Bea, in charge. (And to Bea our thanks for this news of the happenings.) Lots of talk took place with everyone getting acquainted or meeting again. W5BKG won a pair of rhinestone ear screws; W5OTU, a pair of hose; W5JAD, theatre tickets; W5DUR, two chicken dinners; and W5SPV, a shampoo and set. Saturday noon there was a luncheon and style show for all the YLs and XYLs, also at the Commodore Perry Hotel. The prize at this occasion was a $50 clothing certificate, together with a dozen smaller prizes. Saturday afternoon in the Sun Room of the Stephen F. Austin Hotel Miss Mary Goldman of the Home Economics Department of the University of Texas gave a demonstration of flower arrangements at a tea for all the YLs and XYLs. Main prize this time was an electric blanket.

Saturday night everyone had a wonderful time at the dance given in the Mural Room of the Stephen F. Austin Hotel, and Sunday morning in the Sun Room there was coffee for everyone with more prizes for the XYLs. Sunday noon the banquet, final event of the convention, took place in the Mural Room. Division Director W5CA, Mid, awarded a sterling silver pin made by his XYL to W5BKG, Helen, for being the YL present with the oldest ham license.

**Address all correspondence to 959C-24th St., Los Alamos, New Mexico.*

YLRL Activities

The annual YLRL Anniversary Party contest, usually scheduled for November, will be held this year early in December—we wouldn't have much luck competing with the Sweepstakes! Watch for details in the next issue.

Several YLRL Nets already are in swing, having started early in October.

Band	Freq. (kc)	Day	Time	NCS
40 C.W.	7105	Tues.	9:00 p.m. EST	W3CDQ
20 phone	14,240	Thurs.	2:00 p.m. EST	W9GME and W6FEA
75 phone	3900	Mon.	8:00 p.m. EST	W7JFB

Miriam, W7JFB, is calling her net the Northwest States 75 Phone Net. Other nets for other areas will be started on 75 as soon as NCS are lined up, as well as nets for other frequencies.

All YLs are welcome to call in on these nets, whether members of YLRL or not. So come on in and join the fun.

Most of the YLs attending the West Gulf Division Convention at Austin, Texas, Aug. 18-19. L. to r.: W5RYX, DUR, BKG, SNL, QXR, PYK, JAD, EUG, PDU, and SPV.

Club Doings

From W6ZYD comes news of what the San Diego YLs have been up to. Elections were held in June. The new president is W6JKE, Ruth Chiles—who, by the way, is now off for an FB vacation; a two-month trip to Hawaii with her OM, W6ROI. Other officers are; vice president, WN6MWU, Mary Poe; secretary, WN6???, Alice McCleary; treasurer, W6YXI, Neva Fredenburg. An installation luncheon was held for them on July 7th at the Harbor House.

At the August club meeting W6YXI and W6ZYD reported on the National Convention. These two YLs and their families drove up together and all had a wonderful time. Seattle is the home town of W6ZYD's OM so they had lots to catch up on. Returned via Idaho and Nevada. Plans for the club's September meeting call for a beach party.

YL of the Month

It always makes us feel good to hear about YLs like W5ROB, as we did from W5PGG. When we think *we* have a lot to do and then take a look at some of these "wonder gals" we decide we can't be so far behind the 8-ball after all.

W5ROB is Helen Wesson, of Guntown, Miss. To start off her activities Helen and her OM have three little harmonics—all YLs, ages 4, 3 and nearly 2. And as she says, with them there is never a dull moment!

When Helen wrote us she was just about to model a play dress of her own design at the regional Home Demonstration Club Council at State College, Miss., and on which she won first prize for the northeast region.

Other hobbies include almost everything except photography. Both Helen and her OM like to fish, hunt, swim, play tennis, bridge, canasta, and almost all competitive games. At present they are trying to revive an interest in flying and cram it into some part of their schedule. Still in the planning stage, they hope to develop a landing strip this winter and possibly get their own plane next year.

Add to all this ham radio! "As to the acquisition of our ham tickets," says Helen, "here's the story. When we were married the OM and I had previously acquired considerable radio background from his college training and our progress through Army and civilian training schools. His Army career became Radar Instructor in Signal Corps schools, and mine as civilian radio and instrument repairman on Army posts. This association was dissolved upon his assignment to overseas duty with the Far Eastern Air Force. Like most servicemen's wives I came home and cast around for employment and discovered a radio shop sans mechanic which I operated briefly before being assigned to Brookley Air Force Base in Mobile, Ala., as Radio Repairman.

W5ROB, Helen Wesson, and jr. YLs, Dale, 2, Lynn, 4, and Vicki, 3.

"After John's discharge from military service following the war, we bent our energies toward operating a farm, and, in good farmer tradition, raising a family. With the latter we were highly successful, acquiring three girls in as many years!

"It soon became apparent that usual recreational pursuits such as social functions, movies, etc., were at best difficult to participate in with three babies —and sixty cows—to attend to at home. Being SWLs the idea of becoming hams was sparked to a real determination by a series of 75-meter QSOs in which we participated as guests of our neighbors, W4ODN, and gabbed with another close friend, W4KUW.

"And so the work began. At that particular time I was recuperating from an operation and John brought the instructograph to me at the hospital, complete with a good supply of pencils and paper so that I would not waste hours that might be spent on earning that ticket! Within a few weeks, and after burning much midnight oil over key and headphones, we were ready for the Class B exam, and our licenses were immediately forthcoming, with consecutive calls (John's is W5ROC). A year of operating our modest c.w. ten phone and mobile equipment and we were ready for the Advanced Licenses that each of us now holds (acquired on a lucky Friday the 13th this last July).

"So, as John says, we pursued our tickets as we did the acquisition of a family—with vim, vigor, and vitality—and find both highly entertaining. Incidentally, we both dread the day when we must begin taking the jr. ops to the movies—hi."

As for their farm, it is 720 acres, about half in hill pasture and half in flat bottom cropland. They raise Hereford cattle and grow cotton, corn and hay as cash crops. They do no live on the farm but one mile west of the village (population 400) of Guntown. Helen has very little free time for hamming during the day (no wonder!) but she maintains several skeds a day with the OM while he is working out at the farm. He has an 80-meter c.w. rig in his truck. Helen does most of her hamming on 40 meters, but they also have rigs on 10 and 80.

Huumm—could it be that we're just lazy out here??

33—see you next month. W5RZJ

Monthly DX Predictions

GEORGE JACOBS, W2PAJ*

N NOVEMBER, the seasonal propagation trend in the Northern Hemisphere is to cause an increase in the daytime MUFs and a further crease in the nighttime MUFs. The highest ue of MUF for the year is generally reached ring the latter part of November or early Deber (Fig. 1, page 25, August 1951 CQ). The JF on a good many circuits will permit 10 meter nings during November.

The sunspot count is decreasing at a slow rate. pendent on observations at Zurich Observatory, prediction of the smoothed monthly sunspot mber for November is 55.

The pattern of very frequent ionospheric disbances continues. A very severe disturbance curred between 16-22 September and completely rupted all radio circuits to Europe. This disbance may be expected to return according the 27 day recurrence trend on November 6-15. tually the entire period of November 4-19 is pected to be subnormal. Conditions for the Q-DX CW contest starting November 3, should slightly subnormal. Another minor ionospheric turbance is expected between November 26-28. A period of exceedingly good DX conditions y occur between November 21-24.

want to thank all of you fellows who have en sending me information on what you are aring. It is actual reception reports of this type t make it possible to increase the accuracy of predictions. It is intended that the propagation rts be used as a reliable indicator of probable id openings, rather than absolute times for id openings. Your reports and comments will ply us with first hand data to enable increased uracy in future predictions. On this score, a cial thanks to G3CEU, W5FNA, VE1JP, C1AC, W9DPY, I1ER and Mr. R. B. Parker Harwichport, Mass.

neral Propagating Conditions for vember 1951

The following is a brief commentary on exted propagating conditions for amateur circuits m the United States to the five major areas of world for November, 1951. For the most probe band openings for any particular circuit refer the Propagation Charts.

ROPE

Peak daytime MUFs on undisturbed days will proach 30 mc on most paths from East and ntral U.S.A. Ten should see some good openss, especially to Southern Europe and North rica. In fact, 10 meters will be at its 1951 best ing November. Plenty of activity is expected on 20 meters although the band will go out earlier than during September and October. During normal conditions, ionospheric absorption is lower than during previous months and signals should hold up well throughout the day. Decreased ionospheric absorption will also permit DX activity over all dark paths on 40 and 80 meters. There is a good possibility that 160 meter signals should break through on some nights. Check propagation charts for time (same times as 80 meter openings). These transmission paths favor Central and Eastern U.S.A. because of auroral zone clearance. Conditions will be poor to the Pacific Coast because of auroral zone absorption.

SOUTH AMERICA

During November the North-South paths are characterized by high maximum usable frequencies. Ten meters should provide good solid circuits. Conditions on 20 meters will again be excellent, although the band will fold early in the evening.

DX conditions on 40 and 80 meters are expected to be very good. Signal levels should be strong on many evenings from after sundown to just before sunrise, with 160 meter openings possible to especially Central America.

Conditions favor Latin American countries north of the Equator, since the summer season is approaching for the countries south of the Equator.

AFRICA

Fairly good conditions should exist from Eastern and Central sections of the U.S.A. to Africa. Ten meters will open to all sections of Africa. In fact, conditions from the Pacific Coast to Africa should also be fairly good.

On 20 meters, signals from North Africa will follow the short direct path—absorption is relatively low and signal levels are expected to be strong. Circuits from Central and South Africa will be much weaker because of increased noise and absorption factors with 20 and 40 meter signals possibly coming around the long way with the VKs. It should be remembered that the propagation tables are based upon the short, direct great circle paths.

Forty and 80 will open on North African paths during the all-dark period, with conditions permitting, on propagationally quiet days, some 160 meter activity. On more southerly paths, 40, and to a greater extent, 80, will be erratic and poor because of the higher absorption and noise factors associated with these paths during November.

OCEANIA: (Australia and New Zealand)

It's nearing summer down under, and that means increased absorption by the ionsphere, and higher static levels. The MUF is expected to rise enough to permit some good 10 meter openings to all areas of the U.S.A. Twenty meters should provide a fair number of days with the usual openings just after dawn and sunset local time. Poor to fair conditions on 40. Openings on ionospherically quiet days. Not much 80 meter activity expected.

(Continued on page 61)

20 Bedford Ave., Brooklyn 10, N. Y.

NOVEMBER 1951

EAST COAST TO: (Centered on Washington, D.C.)	10 Meters	20 Meters	40 Meters	80 Meters
	ALL TIMES IN GMT			
Scandanavia	1400-1630 (1)	1100-1300 (2) 1300-1700 (1-2) 1700-1900 (3)	2300-0800 (2)	2330-0730 (1-2)
Great Britain & Western Europe	1400-1700 (2)	1100-1400 (3) 1400-1730 (2-3) 1730-2100 (3-4)	2100-0900 (3-4)	2200-0800 (2-3)
Balkans	1300-1700 (2)	1100-1200 (2) 1200-1700 (1-2) 1700-1930 (3)	2200-0630 (3)	2200-0630 (2)
Central Europe	1400-1700 (2-3)	1100-1300 (3) 1300-1800 (2-3) 1800-2000 (3-4)	2300-0800 (3-4)	2330-0730 (2-3)
Southern Europe (North Africa)	1330-1830 (3)	1000-1200 (3) 1200-1800 (2) 1800-2200 (3-4)	2200-0700 (3-4)	2230-0630 (2-3)
South Africa	1200-2000 (3)	1000-1600 (1) 1600-0000 (2-3)	2300-0330 (0-1)	Nil
Near East	1300-1600 (2-3)	1030-1700 (1-2) 1700-1900 (3)	0000-0400 (2-3)	0000-0400 (1-2)
South America, East Coast	1200-2030 (3-4)	1100-1200 (2-3) 1200-2030 (1) 2030-0000 (3-4) 0000-0600 (1-2)	2300-0900 (3-4)	2330-0830 (2-3)
Hawaii	1730-2330 (4)	1430-1700 (3) 1700-2200 (1-2) 2200-0300 (3-4)	0400-1400 (4)	0500-1300 (3)
Oceania	2100-2300 (2)	1200-1500 (2-3) 1500-2200 (1) 2200-0100 (2)	0400-1200 (1-2)	0500-1200 (0-1)
Guam	2130-2300 (2)	1300-1530 (2-3) 1800-2000 (1-2) 2000-0030 (1) 0030-0300 (2-3)	0600-1200 (2)	0700-1200 (1)
Japan	2130-2300 (0-1)	2000-2200 (2-3) 2200-2330 (2) 2330-0130 (2-3)	0500-1200 (1-2)	0600-1200 (0-1)
India	Nil	1130-1430 (1-2)	0400-1000 (1-2)	Nil

CENTRAL USA TO: (Centered on St. Louis, Mo.)	10 Meters	20 Meters	40 Meters	80 Meters
Great Britain & West Europe	1500-1730 (1-2)	1100-1200 (2) 1200-1600 (1-2) 1600-2000 (3)	2200-0800 (2-3)	2230-0730 (2)
Central Europe	1500-1800 (1-2)	1100-1200 (2-3) 1200-1700 (2) 1700-2000 (3)	2230-0730 (3)	2300-0730 (2)
Southern Europe & North Africa	1330-1900 (3)	1130-1400 (3) 1400-1900 (2) 1900-2200 (3)	2300-0700 (3-4)	2330-0630 (3)
South Africa	1230-2030 (3)	1100-1700 (1) 1700-0000 (2-3)	0000-0400 (0-1)	Nil

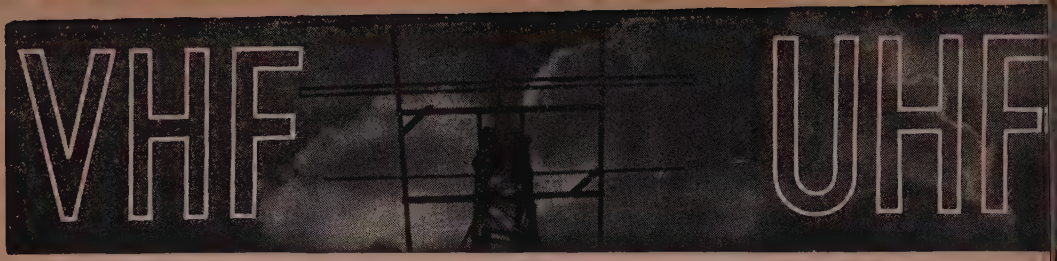
NOVEMBER 1951

cont'd

ENTRAL USA TO: entered on . Louis, Mo.)	10 Meters	20 Meters	40 Meters	80 Meters
	ALL TIMES IN GMT			
uth America, st Coast	1200-2100 (4)	1100-1300 (3) 1300-2100 (2) 2100-0000 (4) 0000-0800 (2)	0000-0830 (3)	0000-0800 (2-3)
waii	1700-0130 (4)	1430-1800 (3) 1800-2300 (1-2) 2300-0400 (4)	0400-1500 (4)	0500-1400 (3)
eania	1530-1700 (1) 1930-0100 (3)	1400-1630 (3) 1630-0000 (1) 0000-0330 (3)	0600-1400 (2)	0700-1300 (0-1)
pan	2200-0000 (2)	2030-2300 (2-3) 2300-0030 (1-2) 0030-0300 (3)	0600-1400 (1-2)	0630-1300 (0-1)
lia	Nil	0130-0230 (1-2) 1330-1500 (2)	0400-1200 (1-2)	Nil
EST COAST TO: entered on acramento, Calif.)	10 Meters	20 Meters	40 Meters	80 Meters
rope	1530-1700 (1)	1430-1730 (1) 1730-1930 (2-3)	2300-0600 (2-3)	0000-0600 (1-2)
uth America, st Coast	1500-2300 (3-4)	1300-1400 (2-3) 1400-2300 (1-2) 2300-0200 (4) 0600-1100 (2-3)	0300-1000 (3)	0400-0900 (1-2)
eania	2030-0300 (3-4)	1600-1900 (3) 1900-0300 (2) 0300-0630 (3)	0730-1330 (2)	0800-1300 (1)
pan	2130-0200 (3)	2030-0300 (2) 0300-0500 (3-4)	0800-1600 (3)	0900-1500 (2)
ilippines & st Indies	2200-0200 (3)	1730-1830 (1-2) 2100-2230 (2-3) 2230-0300 (1-2) 0300-0500 (2-3)	1000-1400 (1-2)	Nil
am	2030-0230 (4)	1900-2100 (3) 2100-0200 (2) 0200-0500 (3-4)	0800-1500 (2-3)	0900-1400 (1)
aska	2030-0030 (3)	1800-2100 (3) 2100-0100 (2) 0100-0430 (4)	0400-1400 (4)	0500-1300 (3)
rshall Islands	1830-0230 (4)	1800-2000 (3) 2000-0300 (2) 0300-0430 (3-4)	0700-1500 (2-3)	0730-1400 (1-2)
ia	Nil	0100-0400 (2-3)	0800-1400 (0-1)	Nil
th Africa	1600-2300 (2-3)	1300-1500 (2) 1500-2300 (1) 2300-0300 (2-3)	0600-1000 (1)	Nil

Symbols for Percentage of Days for Predicted Path Openings

(0) None (1) 10% (2) 25% (3) 50% (4) 70% (5) 85% or more



Conducted by E. M. BROWN, W2PAU*

THE VHF BAND CONDITIONS during September, 1951, can be classified as "better than normal"—except perhaps on six meters. The Northern Lights furnished most of the excitement, permitting some nice long-haul work on two meters, and making up, in part, for the relatively poor "skip" conditions on six. Ground-wave conditions were frequently above normal in many parts of the country. The Annual VHF QSO Party produced the usual spurt of activity on all the bands above 50 mc. Although conditions during the contest were not completely "flat", it seemed from here that was nothing exceptional in the way of propagating conditions. Too bad that the groundwave opening that developed in the northeast on the Friday preceeding the contest weekend, or the big aurora opening that hit on the following Tuesday didn't coincide with the contest period! Scores might have been a heck of a lot higher. . . . .

Auroral Reflections

It pays to tune with the b.f.o. on! Some of this year's best two-meter DX has been worked on straight c.w. via the auroral route. And it's still not too late to get in on the fun.

On Sept. 9, VE3CAU spotted signs of an auroral disturbance while in QSO with VE3AGU on six meters. Nothing much came of this chance, though, except that an unidentified carrier showing the effects of aurora flutter was heard. During the early evening of the 11th, things were better, and W1STX, W1CGY, W2HFC, W2AMM and W1CK were heard or worked—and these signals were fairly readable on voice. W2ZUW was on deck and he reports hearing most of these stations. Meanwhile, the two meter operators were cashing in on the deal. W2YXE of Troy, N. Y. worked VE3RM and VE3AIB, W2SFK, W2OPQ, W3PMG and others who were active. Ye Ed came in for a good deal of ribbing because we let this one slip by unnoticed! (Working locals, again).

At least one other aurora occured during the week of the 10th, but no details are available as we write this column.

The big one hit during the evening of the 25th. W8WRN heard W1IZY on two meters as early as 5:03 EST. W3AIR also reported that the opening started before sundown. W4HBD of Fal Church, Va., claims that this was one of the wor storms recorded at his location. Apparently t good conditions on two meters came along "waves", the first peaking around 7 PM ES the second around 8:45, and the final phase be around 10 o'clock. Reports from all sections see to agree that the opening died out between 10: and 10:45.

W8WRN found that the best beam heading fro his QTH at Columbus, Ohio, was somewhere b tween northeast and north. The beam patte seemed much broader than usual. W4HBD not a similar broadening of the beam pattern a states that rotating the beam through a thir degree angle produced little change in sign strength. Here at W2PAU's the best bearin was from 30 to 45 degrees west of north, b signals were pretty uniform all the way fro dead north to about WNW. Polarization effec were quite noticeable. W2BV tried flopping h array and found that the signals took a big dr when he got over to vertical polarization. should be noted that during this opening a majorit of the active stations were using horizontal tran mitting antennas). This report further confirm the theory that during an aurora opening the orig inal polarization of the signals is retained despi the auroral scattering.

It is interesting to compare the performances the various stations reported during this openi in an attempt to deduce just what combination antenna and transmitter will pay off best f aurora work. Although it is dangerous to try generalize with the meagre data now on han some facts seem to stand out. First, high pow pays off more during an aurora opening than any other time. Look at the records hung up six and two meters by the stations using highe than-average power—W4AO, W3MQU, W3BG W1HDQ, W8BFQ, W1BCN, W3RUE, W3QK —whenever they are active during an aurora ope ing they are usually among those reported mo consistently. This should not be construed to mea that those using low power haven't got a chance far from it! Some of the most consistent "auro stations" run less than 100 watts. But the perfor ance of the higher-powered stations is a lot mo consistent. This is NOT necessarily the case ground-wave or tropospheric working. There a many factors which are equally important as pow which determine the effectiveness of a station und

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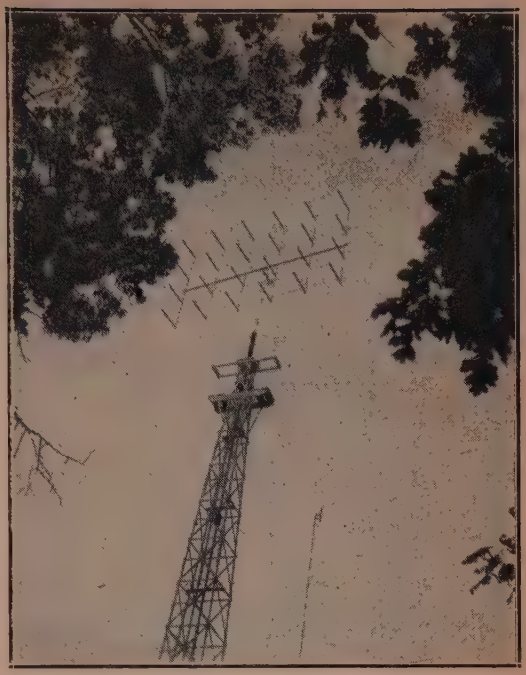
**Now Technical Editor, CQ. Send all future contributions to W. E. McNatt, W9NFK, 2433 Elder Lane, Franklin Park, Ill.*

ormal conditions. Consider the work done by V2NLY and W2BV with considerably less than 00 watts input (up 'till lately!), but with good cations and really *big* antennas! It seems to us at the aurora is a great "leveler"—it doesn't ow up the differences in locations or antennas hich are usually so important. But one can ap-arently build up his signal by running more power ven during an aurora! Could this be due to the ct that the aurora usually fills a great expanse sky—so extensive that even the less-directive ntenna systems can concentrate the full output ower of the rig on the effective reflecting surface? his theory might be supported by the many re-orts of "broader beam response" mentioned above. light the larger (hence sharper) arrays confine e radiation to such a small angle that the prob-bility of the signal's encountering a good reflector actually reduced? Have any of our readers tried vitching to a smaller antenna (of the same olarization) during an aurora opening? If so, d the signals drop less than you had expected? V2BV was thoroughly frustrated during the open-g of the 25th. Despite his 48-element array 80 et in the air, (which usually puts him pretty ose to the top of the pile), Burrill was not able raise any of the many DX stations he called dur-g the opening—although his signals were nor-ally potent in the local area. We checked his erating methods and his frequency (he tried veral) and our only conclusion was that he just asn't getting out! This might tend to prove that ere is an optimum antenna size for aurora! And ow about tilting the beam?. . . . .

HF QSO Party Highlights

There was a good turnout on all the v.h.f. bands r this affair. Two meters showed a high degree activity in the East, as six meters wasn't exactly ide open. However, there were many contestants tive on 50 mc picking up those extra multipliers. While the lack of organized club participation eld the activity to a lower level than usually en-untered in the Sweepstakes, there was certainly doubt that a contest was going on!

As an indication of the way things were going this neck of the woods; W2BV wound up with out 125 QSOs in 10 sections, all on two meters . . K2USA, with W8WXV at the switch, as well over 100 QSOs on two when last heard . . W2UK was also way up there . . . 3IBH just missed making 1,000 points. Charlie now working on plans for a new horizontal-rtical array, a VFO, and a high-powered final ith a built-in beer can opener for future con-sts . . . W2QED found that the extra QSOs 420 were a good way to boost his score . . . 2YXE, of Troy, QSOd 36 stations in six sec-ns on two . . . Some of his neighbors lo-ted just across the section boundary in Western ew York were plenty popular on Sunday morn-g—W2OPQ and W2SFK passed that section t to many of the New Jersey contestants . . . 3KX operating portable on Mount Camelback,



48-element 144-mc Flip-Flop Array of W2BV, Minotola, N. J. The antenna is 80 feet above ground level.

near Tannersville, Pa., found it easier to pick up the distant sections on six meters than on two . . . W2KLZ spent the first night of the contest mobile on Mount Greylock, Mass., but decided to move closer to home for the second day. His two-meter mobile signals were solid as rock from Bald Mountain, near Troy, over 200 miles away . . . W1MEP was operating portable from Hogback Mountain in Vermont, and was very much in demand. Haven't heard whether he was able to break out of the New England area or not . . . W1KCS did a good job of representing the Rhode Island section . . . W8WRN got 41 QSOs in 7 sections W3NKM, of Pittsburgh, Pa., hooked 44 stations in 11 sections; and W8BFQ claimed 100 stations in 14 sections (presumably on three bands) . . . W3GKP of Silver Springs, Md., was in there with two antennas—a 24-element array on vertical and a new 20-element job on horizontal. His neighbor, W3PYW, moved off the RTTY channels to try out his new half-gallon final during the contest. And across the river, in Falls Church, Va., W4HBD with a new twin-five flip-flop and a 522 transmitter made a Virginia contact easy for the boys to the north . . . Ye Ed developed a swell case of laryngitis and was forced to switch to c.w. But that took so much explaining that we finally threw in the towel and admitted defeat . . . W2BV's antenna developed troubles in the middle of the Party—the top bearing on the tower froze with the beam aimed east (a solid over-water path to Europe!)—and his listeners were treated

to some of the choicest descriptive prose ever to hit the band! All's well now, and all 48 elements are turning and flopping again very nicely! . . . W3JDP spent several hours operating mobile from high spots in Northern Delaware. He and W3OEF of Newcastle, Del., were available for those who needed that state . . . The tail end of the opening of the night before was just moving out to sea when the starting gun went off. Early birds were able to get in good DX QSOs with W1BCN and W1DJK out on Cape Cod (Eastern Mass.) before things closed in . . . W2ER was back on two meters, calling CQ as loud as usual!

In short—from where we were sitting it looked like a good party. And it showed anyone who took the time to notice that there is still plenty of activity on the v.h.f. bands!

Things in General

W6NNN has been working portable from Santa Barbara, California, on the 144 and 420 megacycle bands. The results obtained on 420 will be of great interest to those who are still wondering if this band will ever amount to anything. Dick says that he is using only a simple 4-element beam at his location, and numerous contacts have been made with W6IBS and W6BYE at San Diego—a distance of about 190 miles. Signals were S9 in both directions during most of the QSOs, and at no time did they find that contact could not be established! In all cases signals were as good or better on 420 than on two meters. More and more people report these results! Must be something to it. . .

Our friend John Naff, of Port Neches, Texas, is back again under a new moniker—he's now WN5TFW! Congratulations, John! He is currently active on two meter phone and 80 c.w. John passes along the news that the dry weather hasn't helped the v.h.f. DX situation any, but activity around the West Gulf section is holding up pretty well. There is a lot of talk about organizing v.h.f. nets in the larger cities. At the recent convention at Austin there were 81 active v.h.f. hams present at the Roundup . . . W5JBW is still going strong in Maplewood, La., with a 24-element beam . . . W5QIO, W5DSB and W5QME are keeping Beaumont on the map, with the assistance of W5STP, another newcomer to 144 mc. W5SM has sold out his two meter gear and is off the band.

The Southern Ontario VHF Group met on September 7th, with over 100 present. Ed Tilton, W1HDQ, gave a talk on the advantages of using selective receivers on the v.h.f bands. Door prizes were won by VE3AXX, VE3DAT, VE3AET and VE3DGZ. The attendance included 12 W2's from the Buffalo and Rochester areas, W3QKI and W3WBM from Erie, and W8DUL from Ypsilanti, Mich. Thanks to Mrs. Iris Weir, VE3DER for this news item. And keep up the missionary work for v.h.f activity—you're doing a swell job! The next session will be held on January 19th under the capable direction of the Buffalo group, with Tom Stewart, W2TBD, in charge.

W4BRB took time out from his DXing on t lower bands to work VP7NQ on two meters giving him a total of one zone and one count per meter! Gene tells us that VP7NQ is on abo 144.010 using horizontal Vee beams. On a rece trip through New Jersey W4BRB dropped off this QTH and we had quite a talk about the sta of the art. It seems as though he, and several othe are still confused about the antenna polarizati situation around the country. When we suggeste reluctantly, that he might make out better Florida by flopping to horizontal, he said h give it a try. He's done that, and finds that i quite an improvement. Obviously it would be improvement, when most of the stations within range are also horizontal! About all we can s on this score is that the polarization issue is st alive. The northeast coast is prediminantly vertic down to below the Washington, D. C. area. M of the activity on the West Coast is still vertic except for the extreme northern end. The G Coast states are now just about solid on horizont The Midwest has standardized on horizontal e cept for some local net activity which is still ca ried on with vertical antennas. Numerically, t stations still on vertical probably outnumber tho on horizontal. Before rigging up that new tw meter antenna for gosh sakes find out which pola zation is predominant in those sections where you going to want to work! You'll probably find, many others have, that you'll need both. Duri all the years that this controversy has raged, evidence strong enough to sway the proponents either system over to the other has been produce The arguments favoring vertical polarization—ea of attaining gain and general-coverage in a sing antenna, less TVI, better results working mobile etc., are all still valid, and will no doubt stand the way of 100% standardization.

W3GKP caught a good opening on August 3 and hooked VE1QY for his first Canadian QS and his best DX to date—650 miles. (Dare w hint that this DX might have been on vertica Smitty?) Anyhow, with his two new antenna Brother Smith is now ready for anything.

Speaking of new states worked—W8BFQ a W8WJC are now tied with W2BAV (current inactive) for the top nationwide standing on tw meters with a total of 21 states each! The ne one was North Carolina, furnished through t courtesy of W9ASM operating portable fro Mount Mitchell, with WN9OGJ as the secon operator . . . W8WRN got W1IZY in Mass chusetts for #19 via the aurora . . . W8WX has been tearing his hair out at the news of a these steadily rising totals. Al has had to sta from scratch at K2USA, operating under co siderable difficulties, but he's well on the way to new high total.

The best six-meter DX reported this month w from South America. On September 18th, YV5A at Chacao, Venezuela, heard LU9MA at 19

(Continued on page 5

Conducted by HERB BECKER, W6QD*

SINCERE CONGRATULATIONS are extended to our only WAZ for this month.

268 **W6SR** Art W. Fonseca 40 — 180

his and That

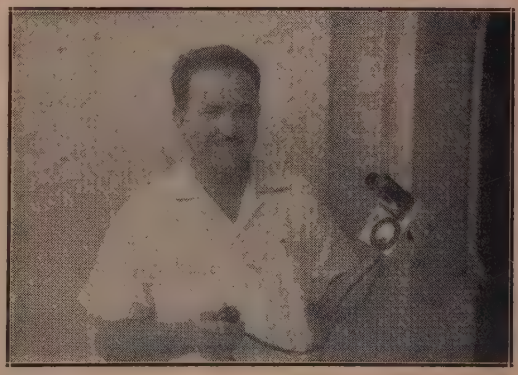
W6BAX and XYL recently visited W4TO down tlanta way. Buck, I suppose, showed them the sual southern hospitality, plus a little of that outhern DX. Sho'nuf! Some of Buck's last DX chievements include KJ6AI, MP4KAE, SV9RP, K9XK, and LZ1DX/ZA, who wasn't on for ng. Oh, yes, let's not forget KM6AW/KS6 on 4167 c.w. . . . VE3AAZ reports that his Zone 3 Rhombic has as yet failed to make the 40th ne for him. . . . OE1FF has added HA5PP, Q5VN, 3A2AC, and 7B4QF. He also worked T1CFN. Sicily, by the way, is not a separate untry. . . . A few of the boys who have worked P8AJ have sent for cards to the QTH listed in ugust "CQ". W2GVZ was one of them and in turn for his card he received a letter from P8AJ's mother, who said the mail only gets down ere about once a year. Since Bill probably won't et back to his home in Scotland until March of 952, I hope you fellows don't get impatient if ou don't receive his card right away. Furthere, his mother is certainly not expected to anver each and every card, so let's not anticipate immediate reply. . . . W8SYC dropped a line the Australian QTH of VK1BS, who is now Macquarrie. He will be back home around pril 1952.

SV9RP is Bob Parker, W1CUY, and operated Suda Island of Crete. KP4KD has received his rd. . . . OX3BF is W6BWS. He is there with e AACS and will probably be there for about year. His QTH is on the Southern end of Greend. . . . W2BJ is looking over an acre in Florida d might become a W4. Ray received a letter from Z1DX saying that he had no QSL cards and ped a letter would do the job. A letter is just official as the piece of cardboard; *providing* it ntains all the gory details. . . .

Three of the latest for W9LNM are PX1AR, 2AD, and VK9DB. . . . For W2NSZ, a oice one was grabbed having the call LB8CH, Jan Mayen, 14020. . . . W2BXA latched on to the same one, plus PX1AR and 7B4QF. On phone Ben added ZM6AA, PX1AR, and VP5BF. . . . It looks as though W1APA has been pretty busy as Communication Officer in the State Guard, but he also found time to work JA2KW and JA7SS. . . . W1ZL hooked MP4KAE on 20, and goes on to add that there were some pretty outstanding signals coming from CE3BM and CE3ZQ on 40. . . . VP9G, who operates exclusively on phone, would like to have it known that some guy is apparently signing his call. He has been receiving cards lately for c.w. contacts on 20, 40, and 80 meters. Bill says that he would like to plan on working a little c.w. himself, but doesn't want to do so until he can get this pirate out of the way. . . .

Well, look what has happened! W9VND (also W2VND for a while) is now located in Cincinnati with the call W8GTV. He will, of course, not be the lone wolf there—what with guys like W8BHW, W8JIN, W8FGX, W8BTI, and W4FU churning up things around in that area. . . . W5FFW recently logged HB1JJ/HE1 and KJ6AQ, both on phone. And on c.w. a couple of good ones were EK1CW and PX1AR. . . . W1MCW worked VP5BF and PX1AR. . . . WØFID, although only 17, is getting along very well. So far he has 33 zones and 118 countries. The final amplifier uses a pair of 813's with 800 watts input. For antennas he has two for 20 meters, a ground plane, and a 2-element vertical rotary, which usually works out better than the ground plane. . . .

FG7XA holding the ten-watter 20 meter (6L6 xtal osc.) which works into a twinlead folded dipole.



end all contributions to Herb Becker, 1406 South Grand Ave., Los Angeles 15, Calif.

W. A. Z. HONOR ROLL

CW & PHONE WAZ

W1FH	244
W6VFR	240
W1BES	239
WØYXO	237
W6ENV	237
W6ADP	235
W6GRL	234
W6MEK	234
W2BXA	233
W3GHD	232
G6ZO	232
W6SN	231
W3EVW	230
W8NBK	230
G6RH	229
W8JIN	229
W6AM	229
W6EBQ	227
W6PFD	226
W6SYG	226
W3KT	225
W3JTC	224
W8BRA	223
W3LOE	222
W6FSJ	222
W6AMA	222
W6BHW	221
W6MVQ	221
CE3AG	220
W6ITA	219
W8DZZ	219
W6MX	219
W6TT	218
WØNUC	218
G4CP	218
WØPNQ	217
W9DUY	217
LU6DJX	217
VE4RO	217
G2PL	216
W2PEC	215
W7AMX	215
W3JNN	215
ZL2GX	215
W6PQT	215
W3IYE	214
PY1DH	214
Z52X	214
KH6BA	214
W6OEG	213
W2AGW	213
W4AIT	213
VK3BZ	213
KH6CT	213
W6HX	212
VE7HC	212
W6NNV	211
VK2ACX	211
KH6IJ	211
W6SAI	210
W6BPD	210
W6MJB	210
W6PB	210
W6TS	210
W9VW	209
W2AQW	208
W8HQW	208
W9NDA	208
ZL1HY	208
W6GDJ	208
W6SC	207
VE7VM	206
W4BPD	206
W6DLY	206
W6KRI	205
DL1FF	205
W6ZCY	204
W6DI	204
W6PKO	204
VK2DI	204
W6AVM	204
W4CYU	203
W7GUI	203
W6EFM	203
W6VE	203
ZL1BY	203
W6RBQ	203
W6RM	202
W6OMC	202
W6AOA	202
G8IG	201
W9KOK	200
VK5JS	200
PY1GJ	199
WØDU	199
W6TI	199
W2IOP	197
KH6QH	197
PY1AJ	196
W6WB	196

CW & PHONE

G2FSR	196
W5GEL	196
VK4HR	196
W6UCX	195
W5KC	195
G6QB	195
OK1FF	194
W6GAL	193
W6RLN	193
WØSQO	192
VK2NS	191
W6RW	190
W6SRU	190
W6EPZ	190
CE3DZ	190
VK3JE	189
ON4JW	189
W6EHV	189
WØNTA	188
W7OY	187
W8SDR	186
VK6RU	186
W6DFY	186
DL7AA	186
W2CZO	185
W1AB	185
W6BUD	185
W6SA	184
KH6VP	184
W3GAU	183
W2JVU	183
I1KN	183
LA7Y	182
WØELA	182
G3DO	182
W6IFW	180
W6SR	180
W6UHA	179
OE1CD	179
PY1BG	179
W9VND	178
W6LN	178
W7DL	177
WØUOX	177
VK6KW	177
W6UZX	177
CX1FY	176
W6IBD	176
KH6CD	176
VK4EL	176
PK4DA	175
W6WKU	174
W6CIS	174
W7FZA	174
W6PCS	174
W6KUT	174
W8HUD	174
W6TZD	173
G5YV	172
OK1LM	172
W6WWQ	172
W6SRF	171
PY1AHL	171
OK1HI	171
VK2HZ	171
W6BAM	170
W7ENW	170
W6PZ	169
W5AFX	169
G2VD	169
W6JZP	168
W6ANN	167
VK3CN	167
W6LDD	167
W6BVM	167
W6DUC	166
KH6MI	166
W6CEM	166
W6JK	165
VE7GI	165
W6LRU	165
W6BZE	165
W6PH	164
W6EAK	163
W6YZU	163
G5GK	163
VE7VO	162
ZS6DW	162
I1IR	162
W6NGA	162
W6PDB	161
W4CYY	161
OK1SV	160
VK3EK	160
W6PUY	160
JA2KG	160
W6MHB	160
W6CYI	157
W7BD	157
WØOUH	157
G3TK	157
W6BUY	157

CW & PHONE

W6QD	157
ZS6FN	157
W7BE	156
KH6LG	156
W6BAX	155
VK5KO	155
G3AAM	154
G2IO	154
W6ATO	154
W6KEV	153
OK1RW	153
W6NTR	153
G3YF	152
KP6AA	152
W6RLQ	152
VK2QL	151
W6LEE	150
W6FHE	150
W6EYR	150
W6LER	150
OK1CX	147
W6LS	147
W7KWC	147
KH6PY	147
W7DXZ	146
W6AYZ	146
VE6GD	146
W9NRB	145
W6MUC	145
OK2SO	145
ON4TA	144
G3BI	144
W7LYL	143
W3IXN	141
I1XK	140
W6AOD	140
W6ONZ	139
W6ID	138
ZC1CL	138
OK1WX	135
G3AZ	133
W6TEU	133
W6RDR	133
W6AUT	133
W6OBD	131
ZS2CR	131
W6IDZ	130
W6BIL	130
W7ASG	129
W7GBW	127
G8IP	127
G5BJ	126
PK6HA	124
G5VU	124
W6NRQ	123
W6MLY	123
ZL1GX	122
VK5MF	121
ZS2EC	116
ZS6CT	113
KG6AL	103
VK6SA	103
W7KWA	98
W6DUB	89
W7IYA	59

39 Zones

W2NSZ	225
W3DPA	222
F8BS	219
W9ANT	218
W9RBI	217
W1ENE	216
W3EPV	214
W5ASG	214
XE1AC	214
W2WZ	212
W3OCU	210
W1BIH	209
W2HHF	208
W1JYH	208
VE3QD	206
W5LVD	203
W9IU	201
W1GKK	201
W8HFE	201
W3DKT	201
W2HZY	200
W8SYC	200
W9LNM	200
W4GG	197
W9MXX	197
W1HX	195
F9BO	193
W2CWE	192
W3KDP	192
W1ZL	192
W2AGO	191
W1AWX	191
OK1VW	190
W9FKC	189
KP4KD	189
W2EMW	187

CW & PHONE

W2BJ	187
W3JKO	186
WØEYR	186
W7PGS	185
W8RDZ	184
W9TQL	184
4X4RE	184
W3DRD	183
W4INL	183
VE3AAZ	182
W1DQH	181
W2CNT	181
W2RDK	180
VE3IJ	180
VO6EP	179
W9HUZ	178
W4RBQ	174
W8CVU	172
W4DKA	172
W4LVV	171
W2RGV	171
W9LM	170
W5FFW	170
W6CTL	169
W1NMP	169
W3JTK	169
OZ7EU	169
W4VE	169
HC2OT	169
PY2AC	168
W2CYS	167
W4AZK	167
W8LEC	166
W9ABA	163
W4BRB	162
W8VLK	160
GM3CSM	159
W4OM	158
WØAIW	157
I1AY	157
VK4DO	156
W9YNB	155
DL1FK	155
W8WWU	155
I1AIV	154
ZS2AT	152
G3AKU	150
DL1AT	150
W6LGD	149
SM5WI	148
W2GUR	146
W2MEL	145
OK1AW	144
W6KYV	143
VK4FJ	143
TF3EA	142
VS7NX	140
W5FXN	140
W9NZZ	139
W6KYT	135
VE7KC	133
W7ETK	132
W6TE	131
W6WJX	131
W7BTH	131
W5CPI	130
W6NZ	129
OE3CC	128
DL1DA	127
W7HXG	127
W6EYC	126
W6MUF	125
VR5PL	124
KG6GD	121
DL3DU	118
W6NRZ	117
KL7UM	117
W6JWL	114
KL7GG	114
W6FBC	114
W6VAT	110
DL3AB	107
W7GXA	105
W6LEV	103
W7LEE	91

38 Zones

W2HMJ	196
W2PUD	181
CM2SW	174
W8KPL	173
W8FJN	173
W2SHZ	169
W2GVZ	162
I1UV	160
SM7MS	159
ZL3CC	159
W8EYE	158
W2UEI	156
W3FYS	156
LU7CD	155
VE2BV	153
W3LVJ	151

CW & PHONE

W5MET	150
W8ZMC	142
WØAZT	143
ZL3AB	143
WØRBA	140
WØFKH	135
VE3ACS	134
TF3SF	134
MP4BAD	133
W6ETJ	132
W4FPK	131
W2PQJ	130
W4LQN	130
W3ZN	129
W9MZP	126
FE8AB	126
W9TB	122
GW4CX	120
EA1AB	119
WØFET	118
KL7PJ	117
VE7VC	116
W6CAE	113
W7EYS	107
VK6DX	103
W6FXL	92
C1CH	84

37 Zones

W1KFV	171
W2ZA	160
IS1AHK	160
W3WU	157
W4IWO	149
W2WC	149
F9AH	146
OZ7BG	144
GM2UU	142
G6QX	141
W4ML	140
W9WCE	140
OE1FF	136
W2AYJ	133
W1APA	131
W7HKT	130
W4DIA	129
VE5JV	126
W9LNH	122
VE1EA	116
G3BPP	112
W6AX	110
WØFWW	108
OH3OE	108
W7PK	104
W8HSW	104
W2BLS	99
W6WWW	99
KL7KV	88

36 Zones

W4HA	166
W2OST	163
W1BFT	156
W5KUJ	154
W3MZE	141
I1IT	140
WØCU	139
W9LI	131
OA4AK	128
VE1PQ	128
I1IZ	128
W3AYS	124
F8TM	124
W2BF	115
4X4BX	112
W5CD	108
W2JA	102

35 Zones

W1DEP	159
W5JUF	152
W4DHZ	132
W9CKP	132
W1MRP	130
ZL1QW	123
OE5YL	122
W6ZZ	121
W9RQM	119
CO6AJ	119
W9DGA	115
W9FNR	114
W8AVB	113
WØGBJ	113
W2HAZ	111
KZ5IP	108
KL7CZ	80

34 Zones

W8NSS	133
W1NLM	130
W4IYT	127
W1RAN	122
W5NTT	107
W8JM	102

PHONE ONLY

39 Zones

XE1AC	207
VQ4ERR	203
W6DI	192
W6VFR	175
PK4DA	175
G8IG	169
W7HTB	161
W8HUD	160
F9BO	150
VE7ZM	145
DL1FK	125

38 Zones

W2BXA	192
W9RBI	188
W6KQY	161
W4CYU	160
ZL1HY	157
W6AM	157
W1HKK	153
W9NDA	149

37 Zones

W1JCX	189
W3BES	186
W8REU	176
W3LTU	169
W8REU	163
CE3AB	163
W9HB	161
W7MBX	158
VK3BZ	158
W6WNH	157
G3DO	157
W6PXH	153
W3GHD	152
W3JNN	150
W8BF	146
W6TT	143
F8VC	124
W7MBW	107
C1CH	83

36 Zones

W1NWO	183
W1MCW	178
W1BEQ	164
W4ESP	154
W2DYR	140
W9BZB	139
GM2UU	135
W9HP	131
W8AUP	131
W6PDB	130
W4INL	129
W1FJN	128
G6BW	127
VE3BNQ	126
VE7HC	123
WØHX	120
W8CYL	112
W3DHM	96
W6SA	92
F8DC	87

35 Zones

HC2JR	171
W4HA	159
ZS6Q	156
W9RNX	149
W6PCK	148
W3EVW	148
W2GHV	137
W2RGV	136
W6CHV	135
WØPUE	135
HC2OT	134
WØEYR	131
W9BVX	130
WØANF	130
WØPRZ	124
W9CKP	124
G8QX	123
W8ZMC	122
W5LWV	108
W4OM	106
W3PA	105
PY2JU	103

34 Zones

W5ASG	152
W3KT	152
W5JUF	137
I1AXD	130
YV5AB	129
LU8CW	129
W2ZVS	128
W5KC	125
W4LZM	124
W6UZX	123
W8BIQ	122
W5JUF	117
W1BPH	105
W4IWO	100
W8UIG	100

XE1AC, as we mentioned last month has tipped us off on someone going to Ifni. Well, as of now, the little safari hasn't come off, but EA8AW is the man, and he expects to get there yet. Al says he has the permit to operate, and he will also journey to Rio de Oro. He plans on taking a 50 watt transmitter and will operate phone only. What? . . . .

West Coast DX Meeting

The combined DX Clubs of the West Coast are planning their annual meeting in Fresno during the weekend of January 19th and 20th. Don Wallace, W6AM, is the chairman of this year's meeting. The Southern California DX Club is the 'Host' Club. The chairmanship has alternated in past years with the Northern California DX Club. This year a special invitation is being given to the San Diego Club, as well as the group in Seattle, which is now forming. Pre-registration is $1.00 and W6AFJ is the Treasurer. An Eimac 4-400A will be the main prize.

W9HUZ got his sigs to bounce about, resulting in AP2N, ZS7D, and PX1AR. . . . LZ1DX/ZA told W1FH he was running 5 watts, and the signals from the States broke through only on September 2nd. . . . Everybody seems to have gotten into the act on PX1AR, including W6GRL, W3DPA, and W6MEK. . . . W3BES sat down in front of his mike and worked MP4KW/P in Yemen. A couple of other A3 QSO's for Jerry were I1AHR/M1 and VQ8AF. . . . Just so you won't forget, W4KE is ex-JA2KG and he also held K2CC just after he came back to the States. Prior to JA2KG, Lloyd and his wife Iris held twelve different calls, scattered around the States and overseas. . . . G4CP hasn't been exactly idle. For example, in a month's time he rolls out such stuff as SV9RP, FG7XA, AC3SQ, and ZS7D, all on 20 c.w., and ZM6AA on 20 c.w. and phone. . . . A little info picked up by W6PQT, and which might interest some of you, is that MP4BAF is ex-VU1AA, VU7AA, VU2BX, and VS8AA. Read on for the QTH.

At last it looks as though we have a good FB8 in Madagascar. This one being FB8BB, who is none other than F9ET. . . . Another fresh one is FD8AA in Togoland, 14 mc. c.w. And, brother, let's hope he is good. . . . G8IG worked 7B4QF on c.w. and good old Bert consistently reminds me that he is still waiting for two phone cards from Zones 18 and 19 to confirm his phone WAZ. . . . Quite a few of the boys have received their cards from PX1AR, who is supposed to be the first official station in Andorra. He apparently operated on the border between Andorra and France at an altitude of around 7000 feet. At least the above was sent to W6AM. . . . Speaking of Don, he worked LZ1RF on 20 c.w., and on 20 phone he scooped up TF3MB. . . .

We are going to lift some stuff from the "West Gulf DX Club Bulletin", which is edited by W5KUC. The latest information on activities in the Seychelles is that the GPO has issued but one license, and that to VQ4KRL, as VQ9KRL. He apparently accompanies his brother, who hunts pirate treasure. (Maybe he will dig up a UX-200, a soft one, that is.) Back to W5KUC—It seems like W5KC doesn't have much time for DX any more, and W5ENE has also been afflicted with something to keep him off the air—the hot weather in Dallas. Thanks to W5KUC for the above.

We are also lifting a few QTH's from the "Southern California DX Club Bulletin", and here is a little dirt. W6AM wants to know who is SVØUN. Don worked VQ8CB on Chagos, c.w., as did W6DFY and W6/BJU. . . . W6GAL bought 7 acres about three miles from W6AM and it looks like George is out for blood. . . . W6CUF still has the Clipperton and Cocos deal in mind. Guess old soldiers never die. . . . DL3MO, while in town, said he had seen a letter to GM6AH from Tibet. It was written in Chinese but said that Bob Ford was a prisoner of the Commies, and was in for 20 years at hard labor. (This, of course, is not the kind of news we like to get). . . . W6FSJ is banging away again on 7 mc., and I guess hauling in some Africans. . . . Thanks to W6SYG for the above, who edits the Bulletin.

W6MVQ sites an example of how the grapevine really gets things twisted. Recently a W4 told him he heard that W6AM was going to VS5 land. Really now, how twisted can we get? Heck, we can't let Don get out of the United States! The same W4, who happens to be JDR, is wondering why some of the West Coast Gang don't promote a trip to Clipperton. Say, fellers, there have been more Clipperton Island expeditions promoted on paper out here than most DX men could imagine. And when you try to test the imagination of a DX man, you are really testing something. Anyway, we started out with W6MVQ, so we will end this little ditty by saying that W6MVQ wishes somebody would go somewhere because he would like to work them. . . . W2HMJ says "I am going from worst to worster on this antenna deal. Was using a 66 foot Zepp tied to a crummy old apartment house next door, and they decided I would have to take down one end of the antenna. Now I am using a 33 foot center fed job on our own roof, which is sandwiched in between a couple 6-story apartment houses." Don't give up, Augie, there will come a day. . . . W1FH says that FB8BB is going to be on the air there for quite a while and plans on using phone in the near future. . . . W1ZL found the last few days of August pretty good for him when he worked PX1AR, EAØAB, and 3A2AD, all on 20 c.w. . . .

VK2AND has changed his location and says the new one is 1000% better. Well, that represents a lot of difference, and now, Brian, we will expect your score to be proportionately better. The main reason for changing QTH's was the conversion of the YL, to XYL. He says strangely enough, he has been on the air more since the conversion took place, than before. Yeah, that is strange all right, but maybe there is more to this conversion business than meets the eye.

(Continued on page 56)

The Newcomer's Buyway

Advertising

"The Hercules"

In amateur radio, just like lots of other hobbies, there are all kinds of gadgets and accessories which one acquires in time as a matter of course. However, probably the first item a radio amateur requires, after obtaining his basic receiver and transmitter, is a dependable microphone, so voice "contacts" can be made. Regardless of whether you are a new-comer or an old-timer in amateur radio, the new Controlled Reluctance mike, the "Hercules" (manufactured by Shure Brothers, Inc., 225 W. Huron St., Chicago, Ill.) warrants your consideration. It is a hand-held magnetic unit that provides clear reproduction, high speech intelligibility, high output and ruggedness at an amazingly low price. Being magnetic, this mike is practically immune to varying conditions of heat or humidity. The "Hercules" can be used indoors or outdoors, fits snugly in the hand, sits firmly on a desk or can be placed on a stand. There are two models with an output level of 52.5 db below 1 volt per microbar. Model 510C "Hercules" lists at $15.00 while the Model 510S, which has a built-in switch, lists for only $17.00. The "Hercules" has a die-cast case, with a Metallic Green finish. See the "Hercules" at your Distributor or write Shure Brothers for further details.

The S-76 Receiver

The greatly increasing number of novice licensees poses an important problem for the fellow about to step out and buy his first communications receiver. Frankly, the Novice bands are just so wide—and no more. The most important thing to look for in your new receiver is, then, selectivity. The new Hallicrafters Model S-76 is the only double superhet with a 50 kc second i.f. channel. This means "on the nose" selectivity only 500 cycles wide. More than enough to read a c.w. signal through the most crowded amateur bands. This amazing degree of selectivity was not accomplished at the cost of sensitivity. This receiver will give you an average half watt audio output of a signal only 2 microvolts strong at the antenna terminals.

The S-76 also features a signal strength, or carrier level meter that really means something. It has the largest and most readable scale of any meter, or any receiver, on the market today. The S-76 also has calibrated bandspreading on all the amateur bands from 80 to 10 meters. General coverage is provided from 540 to 1580 kc and 1.72 to 32.0 mc in four bands.

Using 9 tubes, plus voltage regulator and rectifier, the S-76 has controls for sensitivity, volume, tone, BFO pitch, AVC, Rec./Standby, ANL, and five positions of selectivity. A phonograph input jack is mounted on the rear skirt. The retail price for 115 v. 50/60 cycle AC is the amazingly low figure of only $169.50. A separate speaker is available (Model R-46) at $19.95.

The S-76 is made by the Hallicrafters Company of Chicago. Is designed and manufactured to give the Novice and future General Class ham many years of

Turner Model 60X

After getting your novice signal on the air, one of two factors will serve to identify your particular brand of operation. If on c.w. it will be your fist—on phone it will most probably be your voice. Putting yourself across to the other fellow depends to no small degree on the type of microphone and how you use it. For clean-cut crisp speech, the old-timer will not hesitate to recommend a crystal mike. The crystal microphone has that certain something that will make your phone signal stand out. Obtaining a good crystal mike is not an expensive proposition. The Turner Model 60X, popularly referred to as the "Competitor" sells at a list price of only $19.95. The S60X with an "on-off" switch is two dollars more.

This ideal microphone is completely moisture-sealed and is suitable for use in your hand, on the desk, on field trips or at the home station. Technically speaking, "The Competitor" has a level of 52 db below 1 volt. dyne/sq. cm. and a response ranging from 70 to 7000 cycles.

For more information, see your Distributor, or write to The Turner Co., 929 17th St., N.E., Cedar Rapids, Iowa.

Allied Catalog

In amateur radio, a new youngster is affectionately called a "Young Squirt." We'd like to say a few words to the Young Squirts, (and OM's), reading this. In ham radio there are all kinds of gadgets, accessories and essential parts to be bought. You'll acquire some of these items as soon as you start to build your equipment. Others you'll only "look at" for years. However — before you buy anything — think of Allied's complete, free catalog.

(Continued on page 48)

Your S & W Editor still needs more good ideas for this column. Don't let your nifty stunts go to waste. Rough sketches of circuits are satisfactory, and if you have photos of the idea—send them along. Each idea is worth $2.50 in cash—or a year's subscription to CQ. All S & W contributions should be addressed to Shack & Workshop Editor, c/o CQ Magazine, 67 West 44th Street, New York 17, N.Y.

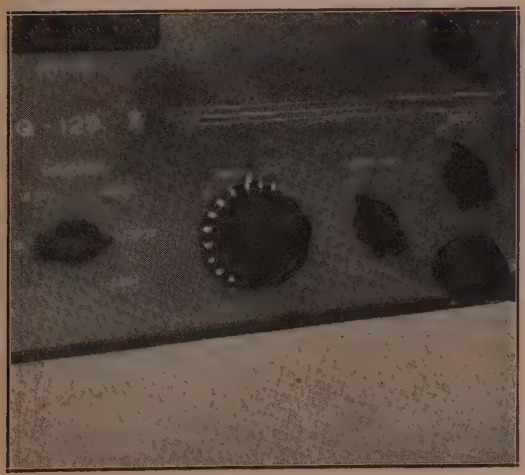
Vernier Knob For Fine Tuning

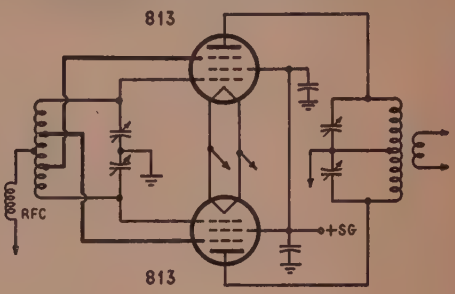
The average communication receiver does not have adequate dial markings to take full advantage of the band spreading when a Q-Fiver is employed. My HQ-129-X has dial calibration every ten kilocycles on the 40-meter band, with no intermediate markings. This is a disadvantage for c.w. work.

To solve this problem, I decided to put dial markings on the bandspread tuning knob. I obtained a small skirt knob about two inches in diameter. With a small draftsman's compass, the rim of the knob was divided into ten equal segments. Lines were scratched on the skirt with a flexible ruler and a scriber. Midpoint lines, half as long as the main lines were scribed as a further refinement.

The numbers 0 through 9 were also scribed on the skirt. After the engraving was finished the markings were filled in with shoe white. After this dries, wipe off the excess material and put a thin coating of clear nail polish on the knob. A spot of white paint on the receiver panel serves as an index. Once you have used these knob markings as a logging aid, you will never want to be without them.

Neil A. Johnson, W2OLU





Neutralizing 813's.

This system of neutralization is adaptable to 813's or any tetrode with an external suppressor connection. The schematic shows the details. Connect the two suppressors to taps on the grid coil, and slide these taps back and forth until the proper neutralization is achieved.

This circuit has several advantages. For one thing, no hgh-voltage neutralizing capacitors are needed. Further, if you use plug-in grid coils, you will be able to provide different neutralization settings for each band, which means you can get exact neutralization when you change bands.

Note that it will be necessary to re-neutralize if you change tubes because the plate-to-suppressor capacity changes from tube to tube. Also, using this circuit, the tubes will require slightly more drive than usual, as the suppressor grids are at a negative potential.

Lee L. Toman, W3BIM

Cure For Tunable Hum

This describes an experience I had with tunable hum, and how I cured the trouble. After installing a brand new transmitter, I found that whenever the filaments were turned on, hum appeared in the receiver. The hum was spread over all bands. The hum was finally traced to the crystal oscillator, and from there to the crystal oscillator power supply.

In this power supply, the filament winding was not center-tapped, and the B-plus connections came from one side of the filament, then on to the filter. I found that I could completely remove the tunable hum by placing a 2 μf capacitor from the other side of the rectifier filament to ground. This capacitor should have the same voltage rating as those used in the filter.

Eric W. Cruser, W2DYR

Conducted by RALPH V. ANDERSON, W3NL*

THE 29.640 mc band has been finally established as a "National and Emergency Calling Frequency." This column has been plugging its use for quite some time. QST has listed it as a 'phone frequency for about one year. We wish each mobile having this frequency available would take the time to read the conditions under which this frequency is supposed to be used. In QST, the following sentence appears: "After contact has been made the frequency should be *vacated immediately* to accomodate other callers". This column contained the same suggestion prior to the adoption of the frequency for this purpose. As previously reported, many squelch receivers and Auto-Call's are in use throughout the Nation on this frequency. However, when the band opens, these units which furnish emergency communication facilities are *completely immobilized,* because stations are using 29.640 mc for routine contacts. Appraising this situation, this column requested comments a few months ago—and we got them; all the way from the fellow who wants a law to keep everyone off; to the fellow that says his license doesn't say anything about staying off of 29.640 and he'll operate there as long as he pleases! In addition, we are acquainted with several operators who *will not answer* a CQ, or a call from a station known to use 29.640 mc for ordinary QSO purposes. The proper answer seems to be, from various comments received, for each operator to provide crystal switching—one crystal on 29.640 mc and the other on an adjacent channel, far enough removed from 29.640 mc that his signal will not operate through a wide-band l.f. receiver. One well established mid-western club uses 29.590 mc as the adjacent frequency. The mobile calls on 29.640 mc, the fixed station answers on 29.590 mc and the mobile instantly switches to 29.590 the moment the call is answered. While in QSO another call can be made by another station—thus, no jamming. Only by the fullest cooperation can the frequency of 29.640 mc be made available as a National Calling and Emergency Frequency.

DF Equipment

Many of the fellows have requested constructional information on direction finding loops, perhaps not so much for hidden transmitter hunts as for locating sources of interference— particularly diathermy interference.

Here are schematics of two loops as used by the St. Paul boys. *Figure 1* illustrates a loop with an r.f. stage in a box at the loop and *Fig, 2* illustrates the construction of a loop feeding directly to the receiver. The loop in *Fig. 1* is to be preferred well above the other because of its increased sensitivity.

The loop is made of co-ax, copper tubing or any convenient material which will "stay put." There is nothing particularly critical about any of the components, or adjustment. Although the dimensions given are shown for ten meter operation, more or less turns can be added for operation on other bands. To check the loop for frequency, place a grid-dip oscillator at the opening on top of the loop. In *Fig. 2,* the loop is turned by clipping off the free ends of the 300 ohm ribbon a fraction of an inch at a time.

When using the loop the sensitivity control is particularly important since greater nulls can be obtained when approaching the source of the signal. When about 1/2 mile from a strong signal, the filament current of the 959 is turned off. For best results, an S-meter should be employed with the receiver. The regular ten-meter mobile whip antenna must be removed or tied down to the side of the car while direction finding, although when taking the first bearing it is left in normal operating position and used as a sense antenna.

We are indebted to WØSMT for the above information.

The Auto-Call

I hope readers will excuse me for once more bringing up the Auto-Call. Because of many requests for further information, we feel that the word hasn't been sufficiently passed around. This device is simple, fool-proof, and permits the mobile operator to call a fixed station, at any hour of the day or night without any attention on the part of the fixed station operator (he can even be asleep). How many mobile groups can accomplish this now? Can you instantly call a fixed station at any hour of the day or night should you have an emergency situation or important business? The latest cities to use the Auto-Call are Ft. Worth, Texas and Baltimore, Maryland. Write me for

*Send contributions to R. V. Anderson, 2509 32nd St., S.E., Washington 20, D. C.

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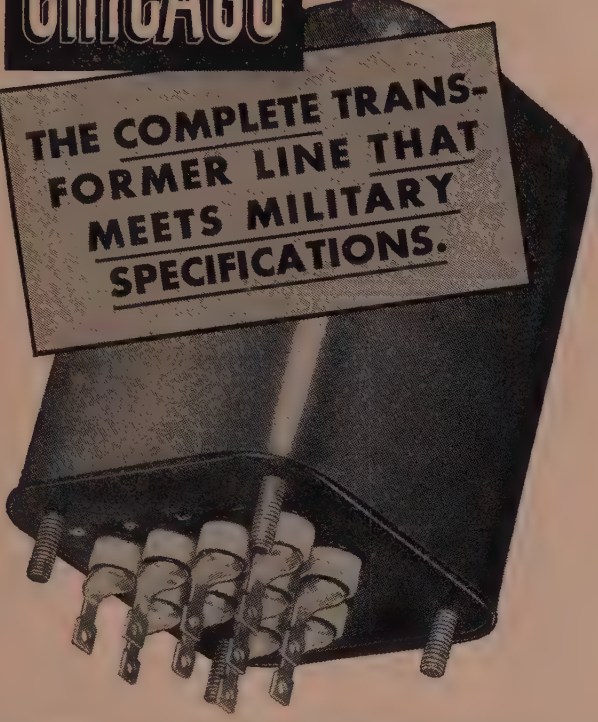

If you want really tough units for rugged applications in your own rig . . . or if you require fully approved MIL-T-27 Transformers and Filter Reactors for prototype models, pilot runs or special applications — write, wire or phone HARVEY for quick service on these Hermetically-Sealed units. We carry a complete range of CHICAGO's MIL-T-27 Transformers: Power, Bias, Filament, Filter, Audio — and can ship IMMEDIATELY . . . FROM STOCK!

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116, 7.5 amps, table mtg..... 23.00
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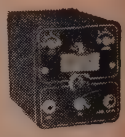
New LYSCO Mobile Transmitters



25 watts minimum peak power. Clamp type modulation. Tuning adjustment from front panel. Dimensions 4" wide, 4½" high, 6" deep. Rounded drawn case, black wrinkle finish. Tubes: Model A 3-6AQ5 . . . Model B 3-6V6GT . . . Model C 3-12A6. 25 watts power minimum. **Amateur:** 10 meters, 20 meters, 75 meters. **Civil Air Patrol:** For either 2374 kc or 4585 kc .....less tubes **$29.95 Net**

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Now you can be sure of maximum antenna performance with this Antennascope based on design of W. M. Scherer, W2AEF published in CQ, September. Used with a Grid-Dipper, you can measure radiation resistance, resonant frequency of antenna, line impedance, receiver input impedance, feedline s.w.r. Reduce TVI, increase xmttr efficiency, improve receiver performance, by knowing and measuring your rig. Eldico Antennascope is available in kit form or completely wired and tested. Kit form ..... **$24.95;** Wired and tested **$29.95**

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NOTE: In view of the rapidly changing price situation in both complete units and components we wish to emphasize that all prices are subject to change without notice, and are Net, F.O.B., N.Y.C.

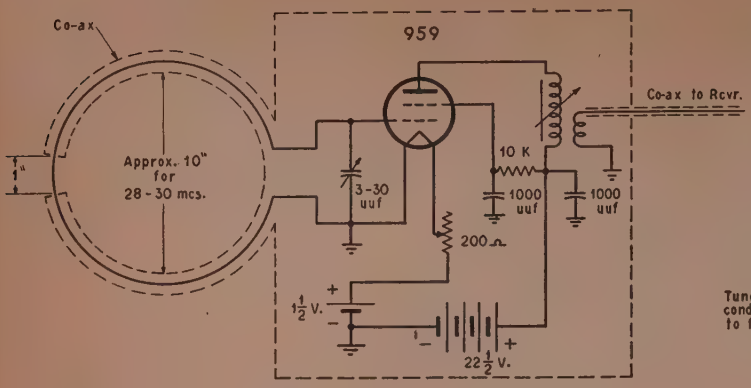
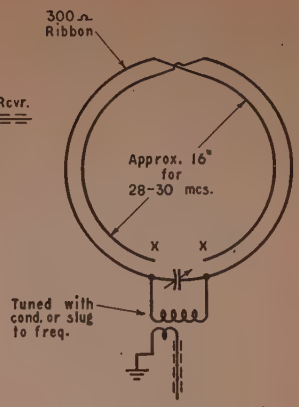


FIG. 1



Clip free ends (marked X) until loop tunes to frequency.

FIG. 2

further details, or see my two articles in the February and My, 1951 issues of *CQ*.

Odds and Ends

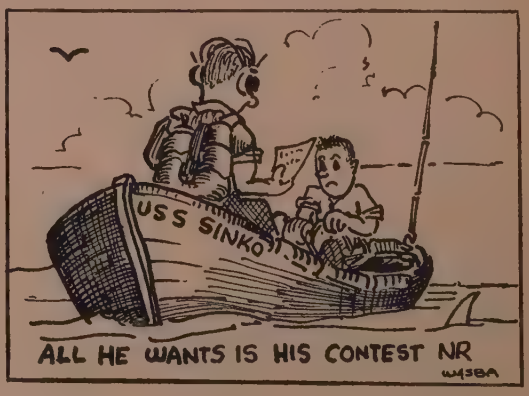
How long has it been since you have oiled the bearings of your dynamotor?

A mica condenser across the contact points of generator regulators will often reduce or eliminate hash from this source. Be sure they are not large enough to increase sparking—you'll burn up the points. . . . Many of the gang are using marker crystal oscillators to set their VFO's. 6 volts B+ in a simple triode oscillator with provision for crystal switching seems to be most popular. . . . Contrary to popular opinion, you are not Maritime Mobile unless you are outside the continental limits of the United States. When you are operating MM, you are confined to the ten meter band exclusively. . . . There is a great demand for operators on sea-going vessels. Here's a chance for an overseas vacation at good wages.

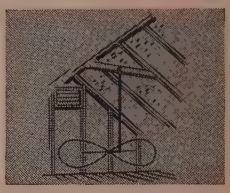
Fixed Stations: *Always* indicate on a QSL to a mobile station that he was mobile when you worked him, preferably by "/m" after the call.

Maritime Mobile Amateur Radio Club

Fixed stations, send your 30 MM QSL's to W3OB, the Secretary of the Club, for the MM certificate. . . . Ady, W6YYT had about six days in New Orleans. Guess what he did? He spent the time helping W5REZ put a beam on the roof of the store downtown. Ady's now bound for Japan. Seems to us the last time they were out there the bottom of the ocean came up suddenly and hit the ship. . . . W4AYE ran into W1SSI out Manila way and did the town up in first class shape. . . . W5STH, a newcomer in the MM crowd was recently QSO'd while just clearing the harbor in Kingston, Jamaica ahead of the hurricane which subsequently wrecked the harbor and killed over 100 people. Jim said they were pouring the oil to the old gal to get away from the big wind. He was last heard at Mobile so guess they made it. . . . W4RW, is back on with a TBS50. Capt. Van brought over the new super-tanker "MAGWA" which, as we understand it, is a tanker to out-tanker all others. . . . Billie, the YL MM op on the Gulf Banker expects to visit Washington State during her vacation—used to be with the Weather Bureau out that way. . . . The second MM certificate to go to England went to G6UT. Along with his QSL's he sent a long list of fellows he had worked, but had not QSL'd. With curtailed operations due to poor band conditions, it is almost necessary to QSL 100% to keep the certificates rolling. . . . On the MM distance record, here's a note from Van, W4RW. "As soon as I get my records, I'll set Ray, W4KEJ straight on the record deal. I worked the Phoenix Islands at a distance of 10,500 miles, although I was using 400 watts instead of Ray's 20. So he still deserves the credit." Send your MM info to W3OB, Secretary of the MM Club.



Here, at last . . . the perfect High-Gain Antenna for Television Primary Area Reception . . .



INTRODUCING THE ALL-CHANNEL

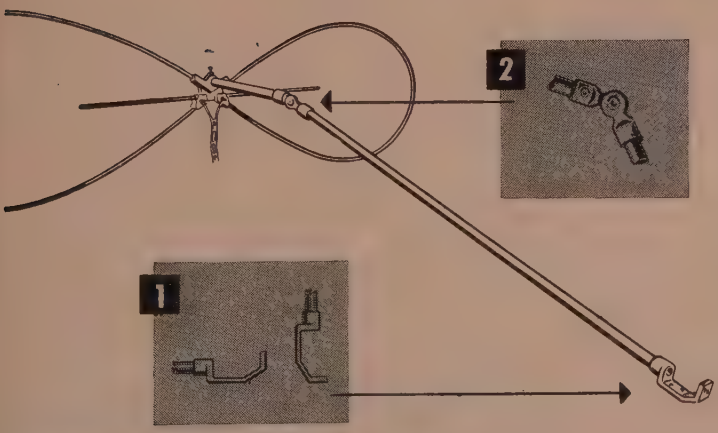
BUTTERFLY SWIVEL-POSITIONED ANTENNA

Tel-a-Ray does it again! The company that has contributed so much to improve long-distance television reception has brought its antenna know-how to improving television's primary area reception. The result is the flexible, powerful new Butterfly . . . the simplest antenna to install and adjust . . . ruggedly constructed of tough, extruded aluminum . . . guaranteed against wind or weather damage . . . a perfected, dependable, low-cost means of assuring the most brilliant TV reception in primary areas.

Never before was a high-gain antenna so foolproof, so flexible, so adaptable for use in densely populated metropolitan areas where a number of stations are operating. It comes with a three-position bracket for mounting at right angles, a 30° angle, or upright with nothing extra to buy . . . or mounted in one-, two- or four-bay arrays for improved reception in outer service areas and near-station dead spots.

Get the best TV reception . . . simply, easily . . . with the Butterfly!

LOW PRICED, TOO! — The Butterfly with the three-way bracket mounting sells at approximately $4.95 Suggested List. The retail price for the single-bay array is about $12.95 Suggested List.



1 Three-way bracket provides for quick, easy installation on window ledge, the roof, practically any place.

The bracket is drilled for installation upright, or at either of the two angles shown. It may be used with either a 300 ohm or co-axial lead in.

2 Easy-acting, quickly locked swivel permits simple adjustment for best reception.

Tel-a-Ray
TRADEMARK
ENTERPRISES, INC.
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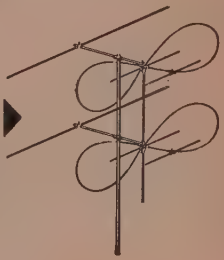


The Butterfly mounted in a two-bay array . . . a low-cost way of getting improved TV reception in outer service areas, or in primary area dead spots.

NEWCOMER'S BUYWAY

(from page 42)

NPA GIVES AMATEURS PRIORITY RATING

The National Production Authority, U. S. Department of Commerce, on October 4, 1951 issued a new order designed to keep amateurs on the air and to encourage an expansion in the number of amateur radio stations participating in defense and security activities.

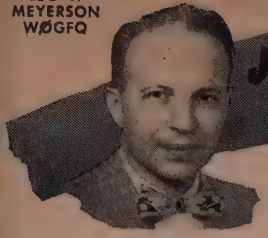
This order grants priority assistance to licensed amateur radio stations.

Under the new order, a licensed radio station operator who needs hard-to-get parts may place a delivery order with his supplier, using the allotment symbol MRO to obtain controlled materials (steel, copper and aluminum), and the rating DO-MRO for components and new equipment. His delivery order must be certified over his signature and show the station call letters.

Members of nine major military and emergency networks will each have an annual quota of $200 in rated orders. Other amateur operators will be limited to $100 of self-rated orders. The quotas may be polled to meet unusual needs. This will permit an amateur needing an additional quota to use the unused quotas of other amateurs through direct arrangement with his fellow operators.

The $200 quota is granted to an individual operator who is an active member of one or more of the following groups: MARS (Air Force or Army), Radio Amateur Civil Emergency Service (Federal Civil Defense Admin.), National Traffic System (ARRL), Flood Emergency Network of Radio Amateurs (U. S. Weather Bureau), National Emergency Net (ARC), Civil Air Patrol (U. S. Air Force), USNR Communications Network, Emergency Corps (ARRL).

(More details in next issue)



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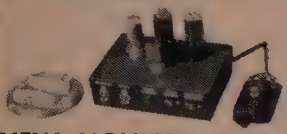

NEW NOVICE CW 7 KIT $19.95

Here is a complete novice 80 meter AC-DC 7 watt transmitting kit — complete with tubes, power supply, tuning indicator, antenna, pi-network, key and crystal. Nothing left to buy — simply wire (complete instructions included) plug into AC socket and go on the air. Will operate on either 110 volts AC or DC.

GUARANTEED CRYSTALS IN HOLDERS Type FT-243

160 METER $1.50 ea.

1.8 to 1.825 — 1.875 to 1.9
1.9 to 1.925 — 1.925 to 2.0

80-40 METER $1.25 ea.

3.5 to 4.0 — 7.0 to 7.4

Please state frequency. We will come as close as possible. No refunds or exchanges, please.

NEW LOG BOOK

For mobile or fixed station. Spiral binding — turns up — lies flat. Full column log listing all FCC required info. Log will accommodate 1,525 stations. Front and back covers show "Q" signals, phonetic alphabet, and amateur international prefixes. **25¢**

RADIO REFERENCE MAP

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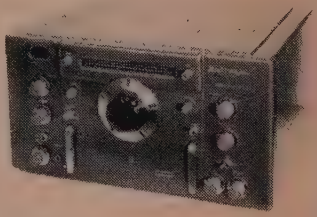
HANDY WALL SIZE

LEO GIVES BEST DEAL ON . . .

National NC RECEIVERS

ON HAND FOR IMMEDIATE DELIVERY!

HRO-50-1 RECEIVER



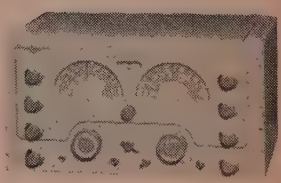
Additional I.F. Stage and 12 permeability tuned I.F. circuits result in the ultimate in selectivity!
Built-in power supply on separate chassis. Front panel oscillator compensation control. 20 to 1 precision gear drive. Provisions for NBFM adapter. Push-pull audio output. Speaker matching transformer built into receiver with 8 and 500/600 ohm output terminals.

$383.50

(less speaker)
LOW DOWN PAYMENT

10" PM Speaker matching cabinet **$16.00**

NC-183 RECEIVER



Sixteen tubes (including rectifier and voltage regulator) are employed in a modern high-gain super-heterodyne circuit. HF oscillator termperature-compensated on all bands; phonograph pick-up jack; accessory connector socket; illuminated signal strength meter with adjustable sensitivity; self-contained output transformer with 500 ohm and 8 ohm terminals; operates from 115 or 230 volts 50/60 cycles or, in emergency, from batteries or vibrator power supply; narrow band FM adaptor available. Frequency coverage: 540kc. to 31mc. and 48 to 56 mc.

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NATIONAL RECEIVERS

NC-125	$149.50	Matching Speaker	$11.00
SELECT-O-JET (#2 or #3)			$28.75
SW-54			$49.95

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- ☐ NC-183 Info
- ☐ NC-125 Info
- ☐ Used Equipment List

Name_____

Address_____

City_____ State_____

VHF-UHF

(from page 38)

EST. On the 20th, he worked OA4AE from 2110 to 2230. On the 23rd things really got hot and he hooked LU's: 6DO, 8BQ, 8AE, 5DC, 2BN, 6DR and 9AS; also OA4AE. The signals were peaking up from the southeast at first but shifted to the southwest during the opening. At the same time the LUs were heard working CE1AH. YV5AC reports that six meter activity was down during the summer in LU-land, but interest is building up in two-meter and 420-mc operation. Gosh, it must be catching!

W2QNZ is back in action on the eastern side of the continent again. Ed was going to school in sunny Southern California when Uncle Sam gave him the nod. After a short session in the service, Ed was able to convince the medics that the country would be better off without him as a burden on the taxpayers. So he's now busy as a full-time announcer, full-time station operator at an AM broadcast station in Dover, Delaware. Ed has his two-meter gear at the transmitter house but he can only operate when the big rig is off the air, as his 150 watts of r-f really plays hob with the BC speech amplifiers! He is wary of trouble with an over-zealous Chief Engineer and Consultant, so the 16-element array must be lowered whenever an inspection tour is scheduled! But even under these conditions W2QNZ/3 is doing a fine job. Look for him in the lower 500 kc of the band (he's VFO) after dark any week night.

And, In Closing

It's been over two years since W2PAU took over the job of v.h.f reporter for "CQ". It hasn't always been easy batting out a column every thirty days, and trying to keep ahead of the correspondence. But we've enjoyed it a lot.

It has been apparent for a long time that Ye Ed hasn't been able to devote enough time to this job to do it right. The six-day week at the RCA plant, the pressure of other interests, the desire to remain active on the air— all these have combined to crystalize our decision that if a suitable replacement could be found, we'd gladly step aside.

Quite by coincidence, another v.h.f reporter made a similar decision at about the same time. Our friend Bill McNatt, W9NFK, Editor and Publisher of "The VHF News", was beset by the same sort of problems. In the September issue of the "News" he announced his plans to suspend publication.

It didn't take much figuring to deduce that if Bill could be persuaded to handle the "CQ" column —a much lighter chore than the publication of a complete monthly magazine—we would all benefit. To make a long story short, the sales talk from this end must have been convincing, for Bill agreed to take over.

Just to set the record straight, one often hears that some reporter is prejudiced—he only prints news about one section of the country, or about

Special Purchase FM Radio Chassis

88-108 MC

Complete with 6 tubes. Built-in Antenna and Speaker. Product of Famous Radio & TV Manufacturer whose name we promised not to mention.

TUBE LINEUP
1-12BA7 1-12S8
2-12BA6 1-35W4
1-35B5

May also be used as an FM tuner by picking signal off detector.

Regularly 29.95
Brand New
$16.95

WEBSTER MODEL 18 WIRE RECORDER

BRAND NEW

DICTATION ● TRANSCRIPTION ● PLAYBACK

- Automatic stops—shut off machine at end of wire
- Pushbutton record-listen switch
- Immediate playback thru 2 inch speaker
- Neon recording volume indicator
- Removable take-up drum
- Elapsed time indicator

Includes microphone with stand, ¼ hour spool wire, plastic dust cover, and removable foot switch. Drastically reduced from Original Price of $135.00 to an all time low of only **$89.50**

RECORDING WIRE
1 hour | ½ hour | ¼ hour
$3.50 | $2.10 | $1.40

NOTE: Do not send money for postage on above items, we ship best way—charges collect.

LOW FREQ. XTALS - FT 241A.

For SSB, lattice filter, etc. ½" spc. 54th or 72nd harm. channels. Listed by fund. Fractions omitted.

72	404	435	506
74	405	436	507
75	406	437	508
77	407	438	509
79	408	481	511
80	409	483	512
81	411	484	514
83	412	485	515
84	413	487	516
85	414	488	518
86	415	490	519
87	416	491	520
88	418	492	522
90	419	493	525
91	420	494	526
92	422	495	530
93	423	496	531
94	424	497	533
95	425	498	537
96	426	503	538
97	427	504	
98	429		
01	431	49c EA	
02	433	10 FOR	
03	434	$4.50	

SCR 522 XTALS

⅛" PINS		½" SPC	
400	462	5910	
440	463	6370	
441	464	6450	
442	466	6470	
444	468	6497	
446	469	6522	
447	470	6547	
448	472	6610	
450	474	7350	
451	475	7480	
452	476	7580	
455	477	7810	
457	479	7930	
459	480		
461			

99c EA
10 FOR
$9.00

$1.29
EA

BC-610 XTALS

2 banana plugs

¾" SPC	
2030	2442
2045	2532
2105	2545
2125	2557
2145	3202
2155	3215
2220	3237
2258	3250
2280	3322
2282	3510
2290	3520
2360	3945
2390	3955
2300	3550
2305	3570
2320	3580
2415	3995
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SPECIAL
200 KC XTALS
without holders
69c EACH
3 FOR $2.00

HAM XTALS—FT 243 HOLDERS—½" pin spc.

190	6773	7840	1015	5825	6440
			1129	5840	6450
030	6873	7873	2045	5850	6473
485	6906	7906	3735	5873	6475
040	6973	7940	5305	5875	6506
			5677	5906	6540
073	7740	7973	5706	5940	6573
106	7773	8273	5725	5973	6575
125	7806	8306	5740	6273	6600
			5750	6306	6606
140			5760	6325	6625
173	49c EA		5773	6340	6640
175	10 FOR		5800	6373	6673
206	$4.50		5806	6406	6706
			7340	7650	
			7440	7673	
			7473	7706	
			7506	7806	
			7540	8240	
			7573	8340	
			7606	8400	

$9.00
10 FOR
99c each

Add 20c for each 10 xtals or less for postage and handling.

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VARIABLE CONDENSERS

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3 GANG - 25 MMF per section **$1.59**

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NAVY VHF BRAND NEW CW TRANSMITTER

Battery operated (67½V."B" and 1½V."A") Frequency 80 to 105 MC. uses 2 1G4 Tubes - with instruction manual - less tubes and batteries.

$4.95

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American Mike—200 Ohms

VR-2T - $42.15 list - Now **$16.86**
D-7T - $27.00 list - Now **$10.80**
D-220T- $71.00 list - Now **$28.40**

VR2T D7T D220T

Ham Transformers, Peerless (Altec Lansing) new, not surplus, priced below cost.

Modulation Trans. 20 w. Universal Model No. M-4081Q. List $9.95. Only **$3.70**

Plate Trans. —2428 V.CT—300 MA. No. P-5196A. List $45.00 —only **$18.00**

Driver Trans. —Universal 70 MA for 15 w. Audio No. A4237Q. List $10.75—only **$4.30**

BC-746 Tuning Units, contains antenna, oscillator coils, 140 mmf midget tuning condenser, double crystal socket, less xtals .. $ .39
With 2 crystals ..... $ .99
With 2 crystals, one in 80 meter band. **$1.29**

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Brand new servo amplifier containing two beam power output tubes (1632) two twin triodes (1632 and 1634) two mica condensers, dozens of color coded half watt resistors, two dual and four section bathtub condensers, three transformers, two wafer switches, the volume control, four octal sockets. With schematic **$3.95**

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COMPLETE WITH COAX CONNECTORS **$2.69**

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ALL NEW — ⅓ OFF!

.500 GAP.	.375 GAP.	.250 GAP.
	11- 8.15	143-19.85
115-25.25	106-20.15	159-21.00
124-26.65	130-21.60	175-22.50
	141-24.50	192-23.95
	153-25.95	208-25.95

Note: Figure in Left Column is Max. Cap. per Section

NATIONALLY KNOWN FAMOUS MAKE HEAVY DUTY SINGLE & DOUBLE STATOR TRANSMITTING CONDENSERS.

Max. Cap.	Gap	Price
300	.077	$ 5.32
230	.171	5.57
250	.219	12.85
500	.219	17.22
75	.344	8.96
245	.344	14.11
150	.469	12.95
100-100	.219	14.11
100-100	.344	15.64
60-60	.469	14.11

TS-13 HAND SET

WITH SWITCH & PLUGS **$4.95**

POTENTIOMETERS

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MAGNETRONS

2J38 - NEW **$14.95**

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many others in stock

WE ALSO STOCK:

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CQ TO ALL HAMS DE W3PPQ

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TERMS

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activities on one particular band, or the like. Tal it from one who knows— that is not the cas Most columnists will gladly print any news tha is sent in. We all have our favorite bands, an generally we are best acquainted with what goes o close to home. So when the time comes to fill i those 12 blank sheets of paper, what could be mor natural than to ad lib about the things we kno best? If there is not enough appearing in prin about activities in your section of the country c about your favorite phase of the hobby *you* can d more about it than anyone else. Just drop a lin to the Editor! Make it a habit to send in a litt news each month—send it in time to meet h deadline—usually around the 20th. We'll all enjo reading about your experiences.

So that's it for now. Hope that we can continu the many friendships which we made while we wer on this job. We'll see you on the air and wher ever possible, in person. Good luck, Bill! 73.

Brownie, W2PA

FOLDED DIPOLE

(from page 28)

pressure of other duties, although additional tes continue to indicate that the formulae for leng and spacing are accurate. Elsewhere, experimente have reported advantages to be gained by spacin according to formula at the antenna ends, a doubling that spacing at the center. The auth has found that this apparent advantage is realiz

Comparative Signal Strength at 3 Receiving Locations

Transmitting Antenna - Hitoyoshi

Local Time	1/2 wave doublet			W3HH Antenna - 60° tilt angle		
	Kagoshima	Miyazaki	Oita	Kagoshima	Miyazaki	Oita
0800	-	-	-	-	-	-
0900	4	2	2	4	2	3
1000	2	1	2	4	2	3
1100	2	1	1	-	-	2
1200	3	1	-	2	-	-
1300	2	1	2	-	-	-
1400	2	1	-	3	1	2
1500	3	1	-	-	-	-
1600	3	2	2	3	2	3
1700	2	1	3	2	2	-
1800	3	1	3	3	3	-
1900	2	3	1	-	-	-

Reception at Kagoshima and Miyazaki was on 2530 kcs.
Reception at Oita was on 3830 kcs.
- indicates no measurement due to QRM, QRN or other reasons.
Fractions in signal strength have been reduced to nearest whole numbe

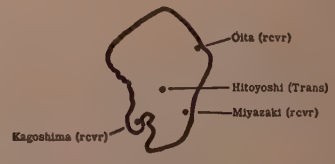


TABLE I

only because a center spacer is needed that w keep the wires fixed in their relative positions. definitely appears that a center spacer is a go idea, but the dimension should keep the two a tenna wires parallel throughout their entire lengt

The only modification to the original data that further experiments indicate the angle of t is not critical. Any tilt angle from about 20 d grees to about 40 degrees will radiate with omn directional characteristics. This greatly increas the flexibility of the system.

Performance Review

Leo Carreras, W3EC, reports that one antenn has been used on the Model TCC transmitter NDM for over a year on all frequencies with r sults superior to individual antennas on the vario bands. The other antennas have since been remove The Model TCC is a Navy 1 KW transmitter modern design, with a frequency range from 2,00 to 18,000 kc.

Captain H. O. Crisp (RAF), now retired, r ports highly satisfactory results and suggested wide center spacing. He also reports excellent r sults on receiving—considerably greater than cou be accounted for by the antenna and transmissio line presentng a better input match to the receive

Field Intensity in db at Various Horizontal Angles

Horizontal Angle in Degrees	Tilt Angle of Antenna				
	44°	38°	30°	24°	18°
0	122.5	120	120	119.5	120
10	121.5	121	121.5	120.5	120
30	121.5	121.5	121.5	121.5	120.5
30	120.5	121.5	121.5	121.5	120.5
40	120.5	120.5	120.5	121.5	120.5
50	121.5	120.5	121.5	120.5	120.5
60	121	121.5	120.5	120.5	120.5
70	120.5	120.5	120.5	120.5	120.5
80	119.5	119.5	119.5	119.5	116.5
90	119.5	119.5	119.5	119.5	117

The horizontal angle is taken relative to plane of antenna. Under the same conditions, the field intensity of a conventional Zepp Antenna was 115.5 at all horizontal angles.

TABLE II

than a comparative single wire and "earth". H used an RCA AR88D in the receiving tests.

Commander H. E. Thomas, USN, W3AIU ha reported that four of these antennas were erected at the Naval Station, Long Beach, California. Eac T2FD was connected to a separate transmitter They were used over the entire frequency range o the antenna with excellent results. The antenna were erected along the sides of a square with th building housing the transmitters in the center o the square. Poles were erected at each corner and each antenna ran from the top of one pole to a point near the bottom of the pole at the adjoinin corner. *Figure 2* shows field strength measurements made at this station comparing the T2FD and the Marconi antenna formerly used.

Some of the most interesting observational ma-
al was from Mr. Yasuhiro Itahashi. Mr. Ita-
hi is a Radio Engineer for the Kyushu Electric
mmunication Bureau (Japan). After extensive
s Mr. Itahashi has recommended that the T2FD
enna be used for all coastal, emergency and
nestic radio transmitting stations on Kyushu
and. His permission has been received to publish
results of some of their field strength checks
l propagation tests.

Briefly their experiments indicated that the tilted
led dipole was superior to the "Zepp" and one-
f wave doublet types previously employed. Wide
d characteristics were observed and the T2FD
ulted in a 4 to 8 db increase in the signal at
ir various receiving locations. Tables I and II
self explanatory and should be of interest to
enna minded experimenters. Table I shows that
eption from the tilted folded dipole gave an
al or louder signal at three widely separated lo-
ions, as compared to conventional dipoles. Table
shows the actual field intensity in db at five
ferent tilt angles over a 90 degree horizontal
tern. The field strength from the same trans-
tter using a horizontal "Zepp" antenna was
5.5 db at all points. The distance from the field
ength meter to the antenna was about two miles.
The author has had excellent practical results
h the antenna. One big advantage to many hams
o are not fortunate enough to live in an area
rmitting an "antenna farm" is that only one
vated point is required. Only 80 feet along the
ound is required for operation on 75 and 80
ters, and only about 45 feet is required for a
meter T2FD. The 80 meter antenna will function
ually well on 40 and 20, while the 40 meter job
l give excellent results down to and including
ten meter band.

PRIVATE LIFE

(from page 6)

ee Subscriptions to Amateur Radio Clubs

The policy of exchanging subscriptions of CQ
Amateur Club Newsletters, etc. is being re-
ablished. Editors and/or secretaries of Amateur
ubs are invited to contact the Editor of CQ on
hanging their club bulletin for a CQ subscrip-
n. Such exchanges will be established on a year
year basis. The only provision in working out
h an exchange is that the Amateur Club print
less than four issues of its bulletin or news-
ter per year.

ff Changes

By the time you have read this far, you will
ve probably noted that two changes in the per-
nel on the CQ masthead have been made. After
ably holding down the job of VHF-UHF De-
rtment Editor for two years, E. M. Brown,
PAU, has stepped upstairs to become Technical
itor. Although a VHF man at heart, the responsi-
ities of the Technical Editorship are more in
eping with Brownie's diversified knowledge of
radio game.

Replacing W2PAU as VHF-UHF Department Editor is another competent writer and VHF enthusiast; W.E. "Bill" McNatt, W9NFK. As this month's Editorial page indicates, Bill has been editing and publishing his own magazine for the past five years, devoted strictly to VHF operation. Outstanding "VHF NEWS" subscribers have been added to the subscription rolls of *CQ*. Welcoming Bill to the *CQ* staff is a great personal pleasure—and to the reader, we hope that it will be accepted as a positive indication of the steps that are being taken to improve and expand the scope of *CQ*.

Cover Photographs

This is something to keep in mind. *CQ* has a standing offer of $25 for good, unusual, exciting photographs that might be used as a cover shot. This does not mean that you must actually take the photo yourself, since most of our covers are taken by professionals. What we want is the idea with a small snapshot to show us how it would look—should we find it usable and want a large photograph taken. Naturally, the implication must tend towards radio, although not necessarily a strictly amateur application. Covers with human interest preferred. Dig through your photos and see if perhaps you have something on file that might fill the bill.

LEGITIMATE PX1A

(from page 29)

We are glad to report that a pleasant consequence of our trip was the resolution by the authorities of the Principality to legislate, at long last, in behalf of the two possible radio amateurs living in the capitol.

Amateur radio is still a novelty to the population of Andorra. The "Churreria" (a mobile canteen where you buy churros", hot dogs, etc.) was placed in the middle of the Plaza Mayor of the capital and re-transmitted our QSOs. We later found out that they supposed we were receiving the latest spy news!! Several "senoritas" of the capital sent us letters soliciting recorded music and inquiring about the time of our future musical programs! All in all, our trip to Andorra was most enjoyable and it is to be hoped that legislation permitting amateur activity will be forthcoming. We are very happy that we were able to receive this promise from the authorities.

DX & OVERSEAS

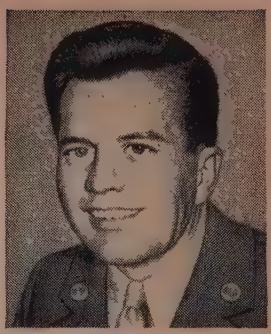
(from page 41)

By the time some of you get this issue we will be right in the middle of this year's World Wide DX Contest. Let's hope conditions are better than they were last year. Certainly, they can't be much worse. Please send in your logs as soon as possible and we think we have worked out a system whereby the results can be printed a couple of month's earlier. You will help but getting yours is early.

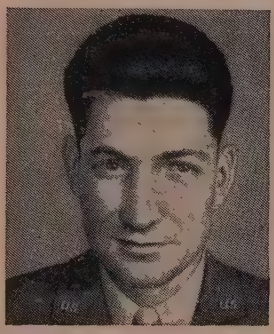
Once again, we would like to have everyone send in their log, no matter whether you have worked five stations or 500. All logs should be post-marked no later than December 15th, 1951. But please don't wait until this date to send it in.

Medal of Honor

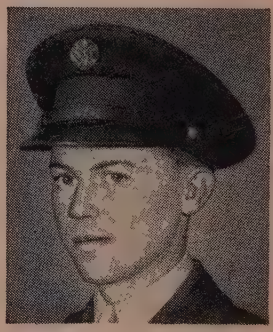
Major General William F. Dean, Berkeley, Calif.—Medal of Honor



Sergeant Charles Turner, Boston, Mass.—Medal of Honor



Lieutenant Frederick Henry, Clinton, Okla.—Medal of Honor



Private First Class Melvin Brown, Mahaffey, Pa.—Medal of Honor

This is the season when you think of stars. The one over Bethlehem. The ones on Christmas trees.

But this year remember another star, too—the one on the Medal of Honor. And make a place in your heart for the brave, good men who've won it. Men who, oftener than not, made the final, greatest sacrifice—so that the stars on your Christmas tree, and the stars in your country's flag, might forever shine undimmed.

Right now—today—is the time to do something important for these men who died for you. You can, by helping to defend the country they defended so far "above and beyond the call of duty."

One of the best ways you can make defense *your* job, too, is to buy more . . . and more . . . and more United States Defense Bonds. For your bonds help strengthen America. And if you make this nation strong enough you'll create, and keep, the peace for which men died.

Buy Defense Bonds through the Payroll Savings Plan where you work or the Bond-A-Month Plan where you bank. Start today!

Peace is for the strong...Buy U. S. Defense Bonds

The U. S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America as a public service.

If you fellows would like to see a few of the unofficial scores printed in the first issue possible after the Contest, you might get me as many scores as you can, including yours, natch, and air-mail them to me immediately after the November 4th weekend. If we get enough scores we will run them.

A minor element of surprise may poke itself into this Contest, and if you hear something signing W6QD, don't pass it up as a pirate, cuz it will probably by me. Just think, one more band on which I can knock off all of those W9's. What W9's? Well, happy piling-on to you, too. See you on the low end, and maybe the high end. 73.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, AND CIRCULATION REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code, Section 233)

Of CQ published monthly at New York, N. Y. for October 1, 1951.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher: Sanford R. Cowan, 1620 Ocean Avenue, Brooklyn 30, N. Y.: Editor: Oliver P. Ferrell, 1614 Elaine Street, Philadelphia 19, Pa.; Business manager: Sanford R. Cowan, 1620 Ocean Avenue, Brooklyn 30, N. Y.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each indiviual member, must be given.) COWAN PUBLISHING CORP., 67 West 44th Street, New York 18, N. Y. SANFORD R. COWAN, 1620 Ocean Avenue, Brooklyn 30, N. Y.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) — None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

(Signed) SANFORD R. COWAN, Publisher

Sworn to and subscribed before me this 7th day of September, 1951.

(Seal) HARRY N. REIZES, Notary Public

QTH COLUMN

DL4FS	Via W6TI.
DU6RG	Box 406, Iloilo City, Panay Island, PI.
EAØAD	Box 2, San Carlos, Fernando PO Isl., SP. Guinea.
FB8BB	M. Loubet, C.G.F. Boanamary, Madagascar.
IS1AHK	Fausto A. Ravenna, Via Principe Amedeo 8 Cagliari, Sardinia.
MP4BAF	J. A. Faithful, Coblet Wireless Ltd., Bahrain Island, Persian Gulf.
OX3BF	APO 858, C/O Post Master, New York, N.Y.
ST2GL	Via RSGB
VP9G	J. W. Gady, P.O. Box 73, Hamilton, Bermuda.
VS7XG	P.O. Box 907, Colombo, Ceylon.
VS9MA	Ian, Station Post Office Khormaksar, Aden.
YI3BES	C/O RSGB
YU1AG	Box 48, Belgrade, Yugoslavia.
ZD2JAB	Joe A. Browne, c/o Posts & Telegraph Hqtrs., Lagos, Nigeria.
3A2AB	Via W6TI
9S4BF	Eugene Stremmrich, Unterer Hagen 32, Saarbrucken 1., Saarland.

160 Meter Trans-Atlantic Test 1951-1952

Our British contemporary, "Short Wave Magazine" is again sponsoring the Second Series of Trans-Atlantic tests for the winter 1951-1952. This is not a contest but a test which will be given extremely wide publicity in the U.S., Canada and Europe. Everyone should greatly increase his own chances of getting across the pond on 160 meters and making interesting QSOs by adhering in detail to the planned schedule. In the interest of all who are taking part, free lance tactics should be avoided.

Dates:

Sundays, 0500-0800 GMT each day: December 16th and December 23rd; January 6th and January 20th; February 3rd and February 17th.

Calling and Listening Schedule:

W/VE stations will call 0500-0510, 0520-0525, etc. European stations (G and all others) will call 0505-0510, 0515-0520, 0525-0530, etc.

Frequencies:

It is expected that the majority of W/VE stations will be between 1800-1825 kc. Certain W's will however, use 1900-1925 kc and 1975-2000 kc.

Calling frequencies for European stations (Gs and all others) will be 1715-1775 kc. This is the area in which the W/VE stations should be looking for CQ's from Europe.

The band 1775-1795 kc will be reserved for G stations and all others calling specific W stations. All QSOs should be effected in this range, and not in the calling/listening bands, if you are a European.

You are invited to send your log—addressed to "160 Meter Tests," CQ Magazine, 67 West 44th St., New York 18, N.Y. or to "DX Commentary", Short Wave Magazine, 55 Victoria St., London, SW1, England. Logs should contain information on the date, time, stations called, stations heard, stations worked, with signal reports in both directions, as well as frequencies and remarks.

Dinner-Meeting of QCWA

The next dinner-meeting of the Quarter Century Wireless Association will be held in Fraunces Tavern, Broad and Pearl Streets, New York, the evening of December 7, 1951, according to John DiBlasi, president. The featured speaker will be Robert W. Gunderson, the blind radio expert, who will demonstrate some of the special measuring and indicating equipment he has developed to permit blind workers to assemble and repair radio receivers, amplifiers, recorders, transmitters, etc.

The QCWA is a fraternal organization whose membership is limited to persons who have held valid amateur radio licenses for twenty five years or more. Many prominent executives in the radio industry, physicians, dentists, lawyers and Army and Navy officers belong to it.

28 MC WALKIE-TALKIE

(from page 26)

again brought close to the plate coil until the oscillation stops. The actual amount of coupling necessary will vary with different layouts.

After the final has been stabilized, the antenna may be loaded by adjusting the series loading condenser and the final brought to resonance all by watching the "S" meter on your receiver. At this point, however, you will probably have to disconnect the antenna of the communications receiver to prevent the "S" meter from hitting the pin.

Conclusion

As pointed out, these walkie-talkies were designed for the specific job of transmitting to a sensitive mobile receiver for distances not to exceed one mile. They do this very well and it is possible to often work from walkie-talkie to walkie-talkie at reduced distances.

The sensitivity of the super-regenerative receiver is sufficient to hear any S8-9 signal regardless of whether it is in Norwalk or South America, and usually the walkie-talkie operator can hear the net control station in addition to his local mobile. The tuned r.f. stage suppresses the super-regen detector radiation sufficiently that no interference is encountered within 100 yards. Selectivity suffers through the use of a super-regenerative detector, but for the use to which these units will be put, it is adequate and this disadvantage is more than offset by the simple AVC and noise limiting action.

To put the units in operation it is only necessary to raise the cover, turn on the filaments, tune in the mobile, close the cover and walk away. If the units are to be stored for any length of time, or are being used in a pouring rain storm, it might be well to seal the cover crack with scotch tape. The handset should also be protected from rain as much as possible by perhaps keeping it in a thin transparent plastic bag.

Keep a record of the number of hours of use of each unit on a card inside the box so that you will know at all times the approximate condition of

the batteries. As to their type, we used two Burgess #5308 or M-30 and two Eveready 482, all rated at 45 v. According to the ARRL Handbook, these batteries should give between 100 and 200 hours of intermittent use with the subminiature tube model receiver, and between 80 and 150 hours with the miniature tube model. The actual life, of course, depends on how much the transmitter is used, the shelf life of the batteries, and the conditions under which the units are stored between emergencies. For example: Do not use out-dated batteries, do not store the units in a hot or damp place, and do not forget to turn the filaments off.

DX PREDICTIONS

(from page 35)

ASIA

Conditions from the Near East Asiatic countries are similar to conditions on European paths, with the exception of increased absorption (weaker signal levels) due to the longer circuits. Some 10, 20, 40 and 80 meter openings are expected.

Poor propagating conditions between India and Central Asia to the U.S.A. Maximum usable frequencies expected are low and auroral absorption high. No ten-meter openings expected and only a few 20-meter openings. Twenty meter signals will be characterized by weak signal levels, and the usual auroral flutter.

An occasional 40 meter opening, but no 80 meter openings are expected.

Improved conditions exist on circuits to Japan. Daytime peak MUFs should be high enough to support ten-meter openings to the Pacific Coast, and less frequently to the Central and Eastern areas of the U.S.A.

Conditions are good for 20, and some 40 meter activity is to be expected. A few 80 meter openings to the Pacific Coast but not to further east because of absorption of the longer circuits.

SCRATCHI

(from page 4)

Well, no time like the present, so I go into garage and look around for some more pipe, to replacing one that is rusted. All I can find is nice 20-foot long piece with some sort of strange looking coupling in the center. Now Scratchi are pretty smart fellow, but I can't see how I can get 20 feet of pipe into ground, so deciding to take pipe apart in the middle and use a ten-foot section. I putting pipe in vise, getting pipe wrench, and giving a try. Five minutes later deciding that I need more leverage, because not getting anywhere.

Look around and find long 2 by 4, and I wire it to handle of pipe wrench, put pipe wrench on coupling, and give a big heave. C R A C K.... Something came apart!! Unfortunately it was the pipe wrench. Oh well, it was an old pipe wrench anyway.

I leaning on pipe, wondering what to do next, when happen to think that Brother Itchi have extra-big pipe wrench he uses on our water pump

Classified Ads

Advertising in this section must pertain to amateur radio activities. Rates: 25c per word per insertion for commercial advertisements. 5c per word for non-commercial advertisements by bona fide amateurs. Remittance in full must accompany copy. Phone orders not accepted. No agency or term or cash discounts allowed. No display or special typographical ad setups allowed. "CQ" does not guarantee any product or service advertised in the Classified Section. Closing date for ads is the 25th of the 2nd month preceding publication date.

10 & 20 meter beams $23.25 up. Aluminum Tubing Etc. Willard Radcliff, Fostoria, Ohio.

BARGAINS: EXTRA SPECIAL! Motorola P-69-13 mobile receivers $29.50; Globe King $315.00 HT9 $199.00; HRO7 $199.00; Temco 75GA $225.00; Collins 32RA $125.00; Collins 32MA $99.50; Collins 75A1 $295.00; new 150 watt phone $199.00; HRO-5T $175.00; Hallicrafters S-47 $119.00; RME 45 $99.00; SX-17 $89.50; Meissner EX Shifter; NC-46, S-40A, $69.50; VHF 152A $69.00; SX-24 $69.00; Globe Trotter $57.50; New Meissner signal calibrators $24.95; MB611 $29.00; 90800 exciter $29.50; XE10 $14.95; and many others. Large stock trade-ins: Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deal to World Radio Laboratories, Inc., Council Bluffs, Iowa.

GOING TO TRY for an amateur radio operator's license? Check yourself with a complete coverage multiple-choice type test similar to those used by the F.C.C. Surecheck tests with answer key, novice class $1.50; conditional and general class $1.75; advanced class $2.00. Order your time-tested surecheck test today. Amateur Radio Supply, 1013 Seventh Avenue, Worthington, Minnesota.

FOR SALE: 1 KW-TVI, $450.00 FOB. Dr. West, Box 2423 Norfolk 1, Va.

WANTED: Collins 32V-1 or 32V-2, cash. W7PMC, Greenough, Montana.

REVOLUTIONARY copyrighted discovery! Learn Morse code alphabet in 15 minutes with amazing new code teacher "PHILKODA." 50¢ postpaid group size $5.00). Philip W. Miner, 7120 Lahser, Birmingham, Mich.

"HOTTEST surplus list in the country. Electronics-hydraulics - aircraft - gadgets. Dick Rose, Everett, Wash."

5 ELEMENT 2 meter Beams. Riverside Tool Co., Box 87, Riverside, Ill.

QSLs? SWLs? "America's Finest!" Samples 10¢, Sackers, W8DED, Holland, Mich.

FOR SALE: A bargain list of gear. W1CPI.

FOR SALE: complete half-kw C. W. ham station. Xmitter 2 813s with exciter, VFO, relay keying for break-in. In Bud cabinet. Coils for 14 and 28 mc bands. Rcvr BC 342 refinished. Finest components thruout. Professional job. Photo 10¢. $250 f.o.b. Los Angeles. K6BN, F. Broady, 4045 1/2 Marathon, Los Angeles 29, Calif.

COLLINS 310-B exciter. Want camera or cash. R.K. Ruggiero, 626 7th Avenue, S. E., Cedar Rapids, Iowa.

TOP cash for APR-4 units and parts; Microwave Test Equipment, ARC-1, ARC-3, ART-13, etc.; TS-34 and other "TS-"; General Radio, L & N, Boonton, Ferris, etc. items; Manuals, tubes, meters and parts. Have TV and Ham equipment. Littell, Farhills Box 26, Dayton 9, Ohio.

WILL trade GE-YRS-1 for Lettine model 240 or other similar commercial transmitter in good condition, E. Okonski, 2110 Clinton Street, Buffalo 6, N.Y. W2VUN.

SELL: TCS equipment, TCS motor generator sets 115 v. d. c., input $35. #804 Federal Sig. Gen., $145. DuMont #164E Scope $65. Want war surplus test equipment TS or I types. Will trade. T. Clark Howard, 46 Mt. Vernon St., Boston 8, Mass. (W-1-AFN).

SELL cheap: Federal FT-102 1 KW phone rig, also transformers, tubes, meters, and other surplus gear. Send for list. W5FSS.

FOR SALE: Hammarlund HQ129X complete with speaker and Hammarlund frequency standard like new, has been used about 50 hours total $145. Morris Stutz, 68-23 Springfield Blvd., Bayside, N. Y., BA. 4-6811.

WANTED: BC-654A, PE-103A, PE-104A, SCR-284A, ARC-1, ART-13, RA-34, RA-62, TCS, BC-610, BC-348, BC-342, BC-312, BC-221, BC-611, BC-721, Radar sets, parts, tubes, Sonar, Loran, MN-26, TS or I equipment, any technical manuals. Will trade. Arrow Appliance, 525 Union, Lynn, Mass.

BARGAINS: New and reconditioned Collins, National, Hallicrafters, Hammarlund, RME, Millen, Gonset, others. Reconditioned S38B $35.00, S40 $69.00, HT18 $79.00, SX43 $119.00, SX71 $149.00, SX42 $199.00, NC 57 $69.00, HFS $99.00, NC173 $149.00, HRO5TA1 $159.00, NC183 $199.00, HQ129X $139.00, SP400X $259.00, DB20 $29.00, DB22A $49.00, HF-10-20 $49.00, VHF152A $59.00, RME84 $69.00, RME45 $89.00, SX25, SX28A, HRO7, HRO5OT, Collins 75A1, others. Shipped on approval. List free. Henry Radio, Butler, Mo.

SALE: two 20 henry, 400 ma. chokes, $7.50 each. TA-12 modified for 40/80, less power supply, $200.00. W5NUN, Tucumcari, New Mexico.

on our well. I dash out to pump house, and there it is. I bring it back, and put it on the coupling. Boy, this time something gotta happen! I rare back, and come down with all my might. C R A S H ! ! I pick myself up off the floor and rush over to see if coupling is loose. WOW! This time something really did happen—I broke the vise. Of all the... Well I'll be a... If that isn't the... this time Scratchi is really mad. Who put those two pieces of pipe together, Superman? I are so mad that I walk around the garage once, twice, three times, and I still so mad that I go into house and sit down on chair before I breaking something else, I so mad.

A few minutes later, as I starting to cool down, I begin to think about Brother Itchi. What are he going to say? How can I explain the broken pipe wrench and the broken vise, not to mention the mess in the garage. Let's see, I heard a noise in the garage, I went out, found a prowler there, hit him on the head with the pipe wrench, then he knocked me into the vise....no, that won't do. Even Itchi knows that my head is not hard enough to break a vise. Even a small one. Especially not that fifty pound one we had.

Hmmm. Well, let's face it. I'll just have to tell him the truth. I had no sooner made up my mind, when I hear the car, and I can see Itchi about to drive in the garage. Oh oh, he stopped. He sees the mess. He picks up the pipe wrench—the three pieces that is. He looks at the vise. Now he's coming in the house. My, look at his face. He looks mad. Without waiting for him to speak, I tell him all about it. How I just wanted to get a piece of pipe. How the little pipe wrench wouldn't unfasten the two pieces of pipe. How the big pipe wrench was too strong, and how the floor came up and hit me in the face.

As I telling this to Brother Itchi, his face are suddenly changing from mad face to laughing face, and first thing you know he are laughing, and laughing, and screaming, and yelling, and finally he rolling on the floor he are laughing so hard. To saying Scratchi are confused at this point is putting it mildly. How come everything so funny?

Finally Brother Itchi are calming down, and he telling me why it so funny. It seemed that he knew my ground pipe is broken, and he are going to fix it for me, so he arranging for man to come out and drill nice big hole down twenty feet so I having good ground system. He are already getting special pipe and having two sections welded together. WELDED TOGETHER!! No wonder big pipe wrench not working! At this point we both start laughing again.

So, Hon. Ed., that what happen to poor old Scratchi. Now if he had just told me....oh well, he didn't. At least I'll have a new ground system. It may not be down to the water level—out here in Arizona the water level is down below the oil level—but at least it will be twenty feet nearer the water.

Respectfully yours,
Hashafisti Scratchi

CQ Ad Index

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Because it was designed and built to out-perform, the NC-183 has always been a favorite. From 2-stage R.F. to push-pull audio output, the NC-183 incorporates every wanted feature of a fine receiver. Now, for the first time in too long, it is once again available for immediate delivery!

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TUBE COMPLEMENT: Uses 2-6SG7 R.F.; 16SA7 1st det.; 1-6J5 osc.; 2-6SG7 I.F.; 1-6H6 2nd det.; 1-6SJ7 B.F.O.; 1-6AC7 A.V.C.; 1-6H6 noise limiter; 1-6SJ7 A.F.; 1-6J5 phase inv.; 2-6V6GT aud. out.; 1-VR-150 volt. reg.; 1-5U4G rect.

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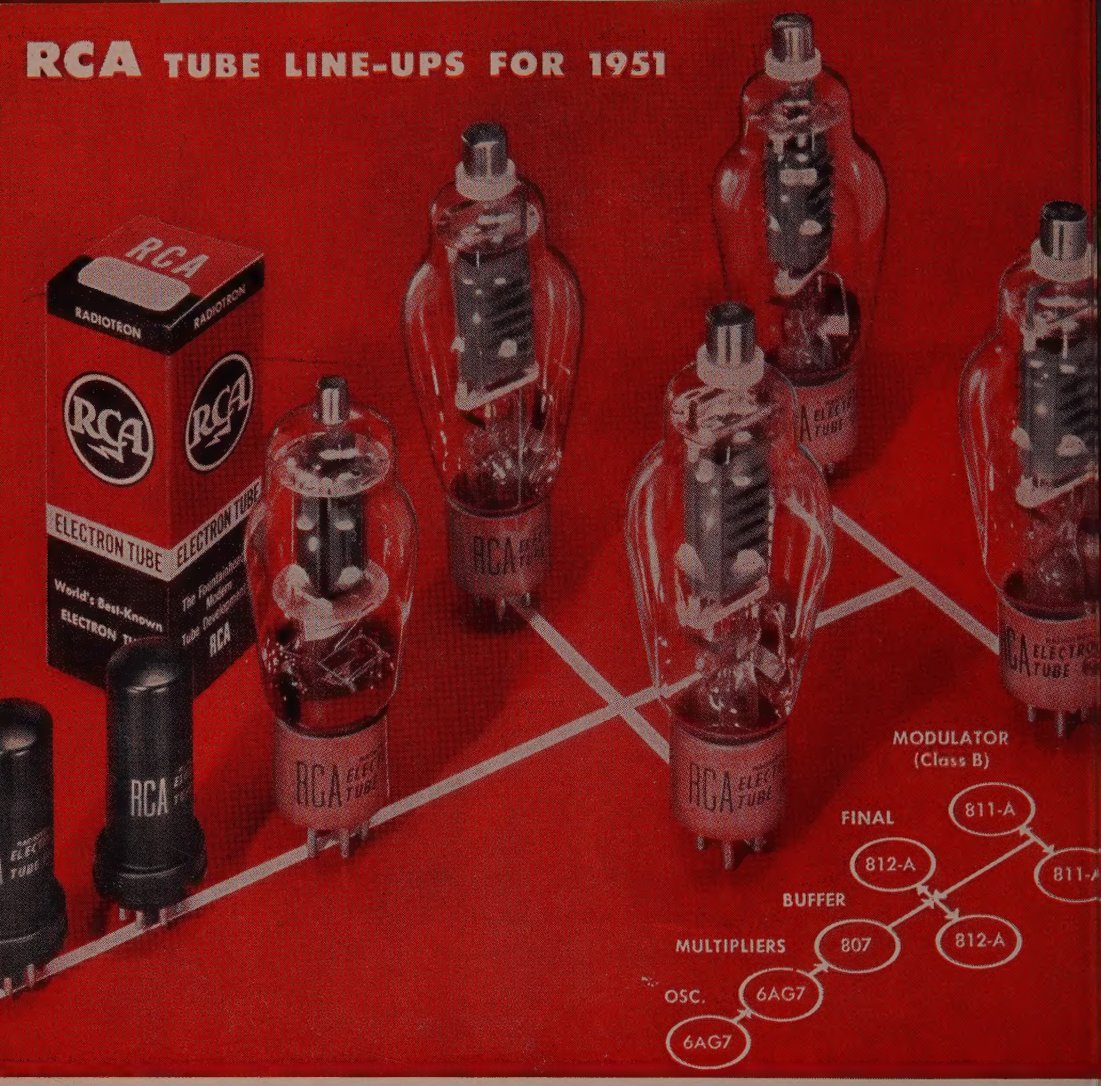

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